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Closing Women's Health Gap: An Opportunity to Improve Lives and Economies in the World

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Abstract

Investments addressing the women's health gap could add years to life and life to years – and potentially boost the global economy by $1 trillion annually by 2040. When discussing the challenges in women's health, a common rejoinder is that women, on average, live longer than men. But this neglects the fact that women spend 25% more of their lives in debilitating health. Addressing the gaps and shortcomings in women's health could reduce the time women spend in poor health by almost two-thirds. This has the potential to help 3.9 billion women live healthier, higher-quality lives by adding an average of seven days of healthy living for each woman annually, adding up to potentially more than 500 days over a woman's lifetime. Beyond the societal impacts of healthier women, including more progression in education and intergenerational benefits,3 improving women's health could also enable women to participate in the workforce more actively. This would potentially boost the economy by at least $1 trillion annually by 2040. These estimates – while significant – are likely an underestimation given data limitations. There are four primary areas that need to be addressed to close the health gap: Science, Data, Care Delivery and Investment. These factors play out in many different ways and to varying extents across regions and income levels. However, the evidence suggests that no geographic region or age group is unaffected. Moving forward requires understanding the broader effects of the women's health gap, and driving action on five fronts: Invest in women-centric research across the research and development (R&D) continuum to fill the gaps in under-researched, often undiagnosed women-specific conditions (for example, endometriosis, and pregnancy and maternal health complications), as well as diseases affecting women differently and/or disproportionately (for example, cardiovascular disease), strengthen the systematic collection, analysis and reporting of sex- and gender-specific data to establish a more accurate representation of women's health burden and evaluate the impact of different interventions, increase access to women-specific care in all areas, from prevention to treatment, create incentives for investment in areas of women's health innovation and develop new financing models, implement policies supporting women's health, such as academic institutions adapting medical school curricula and employers creating pregnancy- and menopause-friendly workspaces. An ecosystem approach, involving multi-sectoral stakeholders, is needed to accomplish these goals. It is possible to create better health for women, allowing greater workforce participation and, most importantly, the ability to live healthier lives.

Keywords: *SDG 5, Health Gap, Gender Gap, Science, Data, Care Delivery, Investment, World*

Introduction

Over the past two centuries, the rise in life expectancy – for both men and women – has been a tremendous success story. Global life expectancy increased from 30 years to 73 years between 1800 and 2018.4 But this is not the full picture. Women spend more of their lives in poor health and with degrees of disability (the "health span" rather than the "lifespan"). A woman will spend an average of nine years in poor health, affecting her ability to be present and/or productive at home, in the workforce and in the community, and reducing her earning potential.

The McKinsey Health Institute and the McKinsey Global Institute, analysts quantified this health gap in terms of disability-adjusted life years (DALYs), and the extent to which this difference is due to the structural/systematic barriers women face. Addressing the 25% more time spent in "poor health" by women versus men would not only improve the health and lives of millions of women, but it could also boost the global economy by at least $1 trillion annually by 2040. This estimate is probably conservative, given the historical under-reporting and data gaps on women's health conditions, which both undercount the prevalence and undervalue the health burden of many conditions for women.

Critically, better health is correlated with economic prosperity. The women's health gap equates to 75 million years of life lost due to poor health or early death per year, the equivalent of seven days per woman per year. Addressing the gap could generate the equivalent impact of 137 million women accessing full-time positions by 2040. This has the potential to lift women out of poverty and allow more women to provide for themselves and their families. Addressing the drivers of this gap, namely lower effectiveness of treatments for women, worse care delivery and lack of data, would require substantial investment, but also reflect new market opportunities. While improving women's health has positive economic outcomes, it is foremost an issue of health equity and inclusivity. Addressing the women's health gap could improve the quality of life for women, as well as creating positive ripples in society, such as improving future generations' health and boosting healthy ageing.

Table 1: The women's health gap 2040

Sl No	Type of Gap	Number/ Percentage
1	Gender health gap	75 Million
2	Effectiveness gap	58%
3	Care delivery gap	34%
4	Data gap	8%

Source: University of Washington's Institute for Health Metrics and Evaluation, "Global Burden of Disease Study 2019", women's health mode

The challenges women face when seeking healthcare play out in multiple different ways and in different diseases and sectors of society. When looking at the potential economic impact of addressing these challenges, all age groups and geographies could benefit, with most of the potential coming from women in the working age group.

Table 2: Women's health gap and GDP impact by age groups

Age group	Additional healthy life years1 lived in 2040 (in DALY millions)	Women's GDP impact by age group (GDP impact in $ billions)
0	8.6	0
10	3.1	46
20	7.2	165
30	9.0	183
40	9.3	206
50	9.7	142
60	10.2	105
70	9.1	61
80	6.7	72
90+	2.1	45
Total	74.9	1025

Source: University of Washington's Institute for Health Metrics and Evaluation, used with permission; Oxford Economics; International Labour Organization ILOSTAT database; Organisation for Economic Co-operation and Development (OECD); Eurostat; National Transfer Accounts project; McKinsey Global Institute analysis

Women's health is often simplified to include only sexual and reproductive health (SRH), which meaningfully under-represents women's health burden. This report defines women's health8 as covering both sex-specific conditions (for example, endometriosis and menopause) and general health conditions that may affect women differently (higher disease burden) or disproportionately (higher prevalence). Research shows that SRH and maternal, newborn and child health (MNCH) account for approximately 5% of women's health burden, although this is probably an underestimate. An additional estimated 56% of the burden is due to health conditions that are more prevalent and/or manifest differently in women. The remaining 43% are from conditions that do not affect women disproportionately or differently. Women are most likely to be affected by a sex-specific condition between the ages of 15 and 50. Other conditions occur throughout women's lives, but nearly half of the health burden affects women in their working years, which often has an impact on their ability to earn money and support themselves and their families.

Pregnancy complications can increase risk for chronic illnesses (for example, gestational hypertension can portend chronic hypertension,10 and women who have had gestational diabetes have a 50% risk of developing type 2 diabetes 7–10 years after the birth of the child). Good maternal health helps the mother and baby, with benefits extending beyond pregnancy and birth. Health

equity encompasses access to the interventions and options that are right for each individual, regardless of their gender, sex, sexual identity, sexual orientation, age, race, ethnicity, religion, disability, education, income level or any other distinguishing characteristic. For women, this can start with a better understanding of and access to interventions that lead to the best outcomes.

The role of science in addressing health disparities

Biomedical innovation builds on the basic understanding of science around body function and the cellular and molecular pathways involved in disease development and progression. Historically, men have both led and been the subject of the study of medicine and biology.17 The majority of animal models have been based on male specimens. Questions about sex-based differences were rarely investigated or recorded, with the assumption – now known to be false – that there are few important differences in the functioning of organs and systems in men and women beyond reproduction. To understand basic female biology better, fundamentally new research tools should be developed (for example, animal models, computational models, patient avatars and humanized models) that better classify women's symptoms and manifestations of disease (as opposed to calling those "atypical"). There is a tremendous opportunity for the healthcare and life sciences community to improve the lives of women around the world.

Effectiveness of and access to medical therapies may vary. There are well-known cases where women and men experience important differences in the uptake or effectiveness of a medicine designed and approved for use for both. This is true, for example, for some therapies to treat asthma and cardiovascular disease. Analysts looked at 183 of the most widely used interventions across 64 health conditions, representing roughly 90% of the health burden for women, reviewing more than 650 academic papers to assess the extent of this phenomenon. Of the interventions studied, only 50% reported sex-disaggregated data. In cases where sex-disaggregated data was available, 64% of the interventions studied were found to put women at a disadvantage, either due to lower efficacy or access, or both, while for men this was the case for only 10% of interventions.

Asthma is a common respiratory condition affecting men and women at similar prevalence rates, where acute asthma exacerbations present as symptoms such as shortness of breath, wheezing, cough or chest tightness. Inhaler therapy with bronchodilators and corticosteroids is a mainstay of treatment. But studies indicate that this treatment is around 20 percentage points less effective in reducing exacerbations in women compared to men. Cardiovascular and cerebrovascular disease – particularly ischaemic heart disease and stroke – is the biggest single contributor to disease burden globally for both men and women, accounting for 16% of DALYs globally for men and 14% for women. One German study found that despite identical technical success of a percutaneous cardiac intervention for men and women, there was a 20% higher age-adjusted risk of death or of cardiac events in women compared to men.

Research in women's health primarily focuses on diseases with high mortality, overlooking diseases leading to disability. One way to assess research priorities is through pipeline assets. There is up to a 10-fold higher volume of new therapies in development for some of the most common women's cancers compared to debilitating gynaecological conditions. One possible reason for this is the higher mortality rate of oncologic conditions. The solution is not to trim cancer funding, but to recognize the possibilities for advances in research related to other women's health conditions, in particular menopause, premenstrual syndrome, endometriosis and polycystic ovary syndrome. Additionally, maternal conditions should receive more attention: while they contribute a similar share to overall suffering among women compared to women-specific cancers, there is a large discrepancy in the pipeline of therapies in development. For example, even though postpartum haemorrhage (PPH) is the leading direct preventable cause of maternal mortality in low-income countries (LICs) and low- or middle-income countries (LMICs), only two new medicines shown to be effective in PPH management have been developed over the past 30 years. In all, when tackling women's health, the solution is not to divide more slices of one pie: it's to make more pie.

How the lack of sex- and gender-specific data and research affects safety? Since 2000, women in the United States have reported total adverse events from approved medicines 52% more frequently than men, and serious or fatal events 36% more frequently. Healthcare professionals in the United States reported 4.4 million serious or fatal events for women versus 3.8 million for men in 2022. An analysis of all medicines withdrawn for safety reasons – a process that requires objective scientific review – shows that, since 1980, products are 3.5 times more likely to be removed because of safety risks in women patients as compared to men.

The research conducted indicates that systematic lack of disease understanding created a women's health gap of 40–45 million DALYs per year, or four days per woman per year. This is equivalent to around 60% of the total gap due to sex-related biology differences. This estimate includes the known gap for conditions that affect both sexes and an estimate of the gap represented by the average lower effectiveness for women-specific

conditions relative to men. It also includes the "unknown" gap: this is where there is no sex-disaggregated evidence available for specific conditions that could, if it existed, potentially demonstrate levels of effectiveness difference comparable to conditions where sex-based analysis is available. The longevity of women cannot explain the disparity: the effectiveness gap has a disproportionate impact on women and girls between 10 and 40 years old and in certain regions such as Latin America and Central Asia. Shining a light on the interventions for which this information was not reported would benefit both men and women, by enabling innovators to develop interventions that are better suited for specific subpopulations.

Data gaps underestimate women's health burden, limiting innovation and investment

Data can quantify problems and measure the impact of potential solutions. It is the critical ingredient of robust, evidence-based analysis and decision-making. Yet many of the datasets (epidemiological and clinical) widely used today fail to provide a complete picture of women's health, both undercounting and undervaluing the health burden. When women's health is invisible, there are missed opportunities to improve lives, especially among women and girls in vulnerable populations. A lack of data also leads to potential underestimation of disease severity and health burden, influencing both the care that women receive and the level of innovation and investment in women's health. For example, there is an emerging body of evidence indicating potential gender bias in the measurement of pain, where women's pain is routinely under-investigated and undertreated, with implications for clinical and psychological outcomes. Collectively, these incomplete datasets can influence decision-making and have the potential to exacerbate the women's health gap.

Women can face barriers to timely and accurate diagnosis

There is evidence of significant and systematic differences in diagnostic assessments between men and women, which has an impact on the calculation of the accurate prevalence and burden for several diseases affecting women. A study conducted in Denmark across 21 years showed that women were diagnosed later than men for more than 700 diseases. For cancer, it took women two and a half more years to be diagnosed. For diabetes, the delay was four and a half years. Analyses of US health records and studies indicate that fewer than half of women living with endometriosis have a documented diagnosis.

Comparisons of endometriosis estimates also indicate unexplained variations. The WHO estimates that around 10% of women of reproductive age are living with endometriosis. In contrast, the Global Burden of Disease estimates this figure to be 1–2%. This discrepancy – an eightfold difference – means there could be anywhere from 24 million to 190 million women affected worldwide.

For women, the difficulty in getting a recorded diagnosis not only creates a barrier to care, but the resultant lack of recorded diagnoses filters into how investors or researchers prioritize needs and assess market potential. In endometriosis, the data gap is primarily due to delays in diagnosis, which is approximately 10 years on average. This leads to lower research investments: for instance, adenomyosis, the sister and highly co-morbid condition to endometriosis, has received two grants from the National Institutes of Health (NIH), yet it affects hundreds of millions of women across the world. In menopause, the challenge is more fundamental. While it is understood that most individuals who are biologically female experience symptoms38 at some point during the menopause transition, this is rarely counted or considered within classifications of health and disease. For example, the IHME Global Burden of Disease dataset currently captures the health burden associated with menopause within a catch-all category of "other gynecological diseases". As a result, it is not possible to identify clearly the underlying prevalence, or the symptom severity (or disability weight) associated with menopause in that dataset. Furthermore, some of the symptoms experienced during menopause, such as mood swings or depression, are often associated with other conditions, leading to misdiagnosis. Additionally, there is a lack of data on maternal health overall, especially in LMICs, which can lead to inadequate healthcare services for pregnant women and new mothers. The lack of data obscures the full picture of maternal health needs, making pregnancy and birth more dangerous for women and creating challenges regarding which interventions or policies to prioritize. The WHO reports that every day in 020 approximately 800 women died from preventable causes related to pregnancy and childbirth – translating to a death every two minutes – and most of these deaths occur in LMICs.

Ensuring sex-differentiated results

Today, only about 5% of trials report the number of participants by sex. The typical perception is that average results across large and undifferentiated groups may dilute the scale of impact for some but create a more unified picture of the value proposition. Representative clinical studies capable of producing stratified results may involve larger and longer clinical trials, increasing costs and extending time to market. However, the results would likely lead to more effective interventions with higher uptake among patients. The risk/reward

equation for investors becomes more balanced if payers (governments, insurers and patients) and regulators insist on evidence for cohort-specific impact. There are conditions today that are believed to affect men and women equally, such as leukaemia or meningitis, but the research to identify potential differences is lacking. Stakeholders may explore how a systematic and proactive approach to designing and reporting clinical outcomes could take sex and gender into account. One route to start working with sex- and gender-specific data analysis in general is through meta-analytical techniques (i.e. combining study results to draw conclusions about therapeutic effectiveness) that can be used to analyse sex-specific efficacy without increasing sample size.50 Other analysis has found that investing in women as investigators could lead to more women being enrolled in trials. Addressing data gaps in women's health would require concerted effort across multiple fronts, potentially including requiring sex- and gender-disaggregated data to further understanding.

Creating sex-and gender-responsive care delivery systems

Several studies have indicated that women are more frequent users of health services than men. These differences, however, may be reduced substantially when adjusted for different levels of need, such as reproduction or differences in disease prevalence. The McKinsey analysis finds that some of this unbalanced usage may be due to inadequate service. Compared to men, women who present the same condition may not receive the same evidence-based care. These delays can add unnecessary costs to health systems, not to mention costs and stress to the patient and their family.

Inequalities exist throughout the full pathway of care

The care pathway runs from awareness of a health issue to access to services and preventive care, timely and accurate diagnosis and effective treatment and follow-up.

Awareness and prevention: Health education, including menstrual education, is one of the most effective ways to help women learn about their bodies. While every country may vary in the types and amount of health education, women around the world who experience conditions such as painful periods, endometriosis, polycystic ovarian syndrome or uterine fibroids may have limited awareness of what is normal and when to seek medical advice. Education can also improve school attendance, teach effective management strategies that reduce symptom severity and reduce potential fertility problems in the future, which are often excluded from health insurance policies. Prevention and promotion are also needed for better health. The human papillomavirus (HPV) vaccine, for example, is proven to reduce the incidence of cervical cancer by nearly 90%, particularly if women are vaccinated when they are younger. In 2020, the WHO launched the 90-70-90 targets, aiming to have 90% of girls vaccinated against HPV, 70% of women screened for HPV by age 35 and again at 45 and 90% of women with pre-cancer treated or with invasive cancer managed. However, according to the WHO, there are great disparities among countries: today, less than 25% of LICs and less than 30% of LMICs have introduced the vaccine, compared with 85% of high-income countries (HICs).60 Some 36% of women worldwide have been screened for cervical cancer in their lifetime, 84% in high-income countries and less than 20% in LMICs or LICs.61 The importance of increasing awareness goes beyond patients – many doctors are not aware of how diseases can affect or manifest differently in women, preventing them from providing proper care to many patients.

Accessibility and affordability of care: Women may encounter barriers related to access and affordability. Healthcare spending and insurance premiums have historically been higher for women. For instance, in Switzerland, healthcare insurance premiums are more expensive for women because they are considered to have higher healthcare costs. On average, Swiss women pay more than 12% extra for supplementary hospital insurance, with greater disparities in specific age groups. A 31-year-old woman pays, on average, 37% more than a man of the same age. Similarly, Indian private insurers employ gender-based premiums, leading to higher expenses for women. Further McKinsey analysis of US co-pay rates finds American women have an average of $135 more out-of-pocket expenses per year compared to men. Of that, $55 is due to higher co-pay rates for conditions predominantly affecting women. Affordability means more than paying for direct healthcare services – it also means being able to afford hygiene products. For instance, around 500 million people worldwide lack access to menstrual products and hygiene facilities. In Bangladesh, a study conducted by the HER project showed that 73% of women missed work for an average six days a month in a textile factory. This absenteeism negatively affects not only business but also the lives and livelihoods of women who are not paid for days they do not work. However, when the HER project provided pads and other work-based interventions (sharing information regarding menstruation, reducing stigma, etc.), absenteeism dropped to 3%. Family planning is also highly relevant. Women of childbearing age who are sexually active must also evaluate the cost of contraceptives, many of which are not covered by insurance. An estimated 257 million women in developing regions who want to avoid pregnancy are not using safe and effective family planning methods,

due to factors such as a lack of access and support, according to the 2023 Global Contraception Policy Atlas. For any woman, a lack of contraception – which can lead to sexually transmitted diseases (STDs) or unintended pregnancy – can, in the long run, result in job loss, career setbacks, diminished ability to support oneself or one's family and higher levels of "family dysfunction". These disparities can be tackled. There are alternative models and systems helping to increase accessibility and affordability of care for women while also reducing costs for healthcare systems and individuals – this includes the US Affordable Care Act and women's health hubs in the United Kingdom.

Timely diagnosis: The male-centric models of disease described earlier can contribute to delays in care and lower-quality treatment decisions once a woman is within the care system. Women are seven times more likely than men to have a heart condition misdiagnosed or be discharged during a heart attack. More sensitive biomarkers to detect heart attacks in women have been identified, and studies are ongoing to validate the impact on health outcomes, but medical school curricula and residency and fellowship trainings need to be updated to reflect these differences. For maternal care, untreated tuberculosis may have a mortality rate of up to 40% in high-risk areas, where women often have lower uptake of treatment probably due to societal norms. One possible solution is the integration of tuberculosis screening in antenatal care for pregnant women. This strategy was tested in Pakistan and proved to be feasible and effective.

Choice of treatment: Accurate diagnosis should prompt delivery of evidence-based treatment. But sex and gender can affect care, even for common conditions. For example, upon discharge, women cardiac patients are less likely to be prescribed secondary prevention to reduce the risk of further events. This (along with other risk factors) contributes to women being twice as likely to die from a serious heart attack. Outcomes after an acute cardiac event could potentially improve via sex- and gender-adapted protocols for guideline-directed management. This begins at admission and continues through the procedure and until discharge. One health system reduced outcome disparities with a standardized system-wide protocol including emergency department catheterization lab activation, a STEMI (ST elevation myocardial infarction) safe handoff checklist; transfer to an immediately available catheterization lab; and a radial first approach to percutaneous coronary intervention. A discharge checklist for guideline-directed medical therapy has been shown to reduce mortality in heart failure patients by 65% for both sexes. While some efforts to achieve gender parity require heavy investment, there are budget-conscious solutions with potentially huge impact. UNICEF produced a low-cost version of a uterine balloon tamponade device to treat maternal haemorrhage. The product, which uses a catheter and a condom, has a 95% success rate and has been scaled nationally.

Creating solutions to tackle care disparities

Overall, the gap in care delivery contributes 34% to the women's health gap. Consider how sex- and gender-appropriate care delivery could reduce the women's health burden by 25 million DALYs per year globally, corresponding to 2.5 days per woman per year. Global public health programmes are increasingly being designed and improved from a sex- and gender-informed perspective. This involves an investigation of the role sex and gender play in health outcomes, including health-related stigma, barriers to accessing health services and vulnerabilities to different health risks. For example, the Stop TB Partnership developed a gender-responsive tuberculosis delivery programme and associated investment package. One pillar of this approach is the routine collection, analysis and use of sex-disaggregated data and inclusion of sex and gender in monitoring and evaluation. Improvements in the diagnostic tools available would represent a major step forward for patients. Yet even without innovative tools, it would be possible to improve care and bridge the gaps in diagnosis with more consistent and standardized screening and data collection. Earlier diagnosis and a more holistic, patient-centric treatment approach could help improve disease and symptom management, prevent uncontrolled progression and resulting complications and reduce unnecessary treatments.

When it comes to affordability and access, counteracting the rise in healthcare costs while benefitting patients and insurance providers could be achieved through approaches such as valuebased care (VBC). VBC aims to link healthcare payments to the quality of outcomes, shifting incentives for healthcare providers from performing more treatments to delivering better treatments. These models seek to enhance care quality and reduce healthcare expenses by emphasizing prevention and high-quality results. VBC models in the United States include accountable care organizations (ACOs), voluntary networks of healthcare providers operating under Medicare. This includes the Medicare Shared Savings Program (MSSP), which returned $1.9 billion in net savings to Medicare in 2020. Outside of the United States, the European Hospital Alliance's nine hospitals have also offered a blueprint that includes measuring costs and outcomes for every patient and bundled payments for care cycles. Value-based models are designed to reduce costs while improving quality outcomes for patients. For example, given the amount

of time, multiple tests and providers a woman may see before an endometriosis diagnosis, a revised model of care could offer a holistic and patient-centric approach that provides a faster diagnosis, reduces costs for a healthcare system or payer and ultimately improves outcomes. At a global level, AI, unbiased datasets and interoperable electronic records are potential options for enhancing care delivery. Ultimately, a combination of innovation, investment and ability to scale could unlock better care delivery solutions for women.

Directing investments towards women's health

More investments are needed to understand biology and improve care delivery for women. There has been a historical underinvestment in women's health research, from the public, social and private sectors. When there is funding, it overlooks the fact that many conditions manifest differently in each sex, creating variances in outcome. Closing the health gap will require increased investment not only for understanding sex-based differences but also for addressing unmet needs in women's health. Further, additional funding and new business models could support sex- and gender-appropriate care.

Research funding neglects women's health: Re-examining policies that are based on actual population needs is one approach. Public funding continues to be one of the primary sources for scientific research. In the US, up to 45% of basic and applied research in life sciences is funded through federal and non-federal sources. The importance of public funding is even higher if we consider that for life sciences companies to reach later-stage development they rely on results from basic and applied research. While women's health funding data by country can be scarce, the NIH allocates 11% of its budget to women's health-specific research in the US; despite women having a 50% higher mortality rate the year following a heart attack, only 4.5% of the NIH's budget for coronary artery disease supports women-focused research. In Canada and the UK, 5.9% of grants between 2009 and 2020 looked at female-specific outcomes or women's health. In another example, as of 2015 there were five times more scientific studies on erectile dysfunction than premenstrual syndrome. In a trial where the medication sildenafil citrate was shown to relieve menstrual pain, research stopped due to a lack of funding. These examples reflect how underfunding certain research leads to and augments the women's health gap. One goal could be for existing budgets to be more fairly distributed to reflect the disease burden and unmet need. When governments and non-profits evaluate resources and policies across populations, they create an opportunity to advance health equity and benefit society. They could consider which investments reap the highest socioeconomic return, including in medical research. One example of targeted investment is the 3not30 campaign by the Women's Health Access Matters to increase women's health research and accelerate investment in sex-based research over the next three years. There remain many attractive, untapped opportunities in women's health. Currently, global life sciences R&D efforts primarily focus on conditions with a high contribution of years of life lost (YLL) to the overall DALY. This has often disadvantaged women because they have a higher probability of being affected by conditions that affect quality of life (years lived with a disability, YLDs) rather than length of life (YLL), such as rheumatoid arthritis, endometriosis, uterine fibroids or diabetes. For example, the disability weight for someone with moderate abdominal pain and primary infertility due to endometriosis is 0.121; for moderate rheumatoid arthritis (RA), it is 0.3017. This translates to a person being willing to trade a year of their life to avoid 8.3 years of living with endometriosis, or trade a year of life to avoid 3.2 years with RA. Additionally, gynaecological conditions, such as endometriosis and uterine fibroids, which affect up to 68%94 of women, have 26 assets in the pipeline. Comparatively, other conditions may affect a lower percentage but have more assets. Addressing sex-specific conditions can pay off: for example, the debut of Viagra for erectile dysfunction, which affected an estimated 152 million men in 1995, generated $400 million in sales revenue within its first three months in the US market in 1998. By 2012, worldwide sales hit a record $2.1 billion. Given the similar prevalence and high unmet need for conditions such as endometriosis and menopause, there is enormous potential for innovative treatments. There is enormous potential around treatments for sex- or gender-specific conditions. For example, there is high interest in breast cancer R&D (646 assets in the pipeline), and sales revenues from breast cancer treatments were at $18 billion in 2022 (comparatively, sales for prostate cancer treatments were $11 billion in 2022). There remains an opportunity to improve outcomes of breast cancer in LMICs, where the fatality rate – 72% – was higher than the incidence rate (62%). Globally, endometriosis, uterine fibroids and menopause are among the conditions with high unmet need and economic potential.

Private equity and venture capital investments in women's health are starting to grow quickly as opportunities in women's health become clearer and more female technology (FemTech) start-ups set out to disrupt the healthcare market. Within the FemTech space, there is a concentration of activity concerning maternal health patient support, consumer menstrual products, gynaecological devices and fertility solutions. The start-ups making the top deals in the past four years mainly

focus on men's sexual and overall health. A McKinsey analysis found that 11 start-ups addressing erectile dysfunction, among other men's health concerns, secured $1.24 billion in 2019–2023, while eight start-ups addressing endometriosis received $44 million. Funding for companies focusing on erectile dysfunction was six times higher compared to endometriosis. However, investors may be starting to see the potential. In the past four years, women's health newcomers received $2.2 billion in funding. Some 60% of the top deals exclusively addressed women's health, specifically endometriosis, fertility among women and maternal and neonatal health. Digital health is another potential avenue for innovation, with the potential to make health more equitable. In the digital healthcare space, FemTech companies received 3% of the total digital health funding. Given the large unmet need and resulting opportunity, those who continue to forgo investing in women's health may find themselves left behind by the players that tap into this high-potential market.

Closing the women's health gap could boost the global economy

The disparities in women's health affect not only women's quality of life but also their economic participation and ability to earn a living for themselves and their families. Health is intricately linked to economic productivity, prospects for prosperity and contribution to economic output. Economic growth over the past 70 years has been closely tied to women's increased labour force participation. Therefore, it is not surprising that the gap in women's health results in lost economic potential. Addressing the additional health burden women face could boost the global economy by adding at least $1 trillion to the global economy by 2040. This means a 1.7% increase in the average per capita GDP generated by women.

Extended participation by women boosts economies and GDP growth.107 The rise in the number of women in formal economic activities since the 1950s has been a major driver of economic growth and wage increases. In a 2023 poll, when women around the world were asked if they preferred to work in paid jobs, care for their families or do both, 70% said they preferred to work in paid jobs. Addressing the gap could generate the equivalent impact of 137 million women accessing full-time positions by 2040. This would enable women to secure an income to support themselves and their families and has the potential to lift more women out of poverty. Beyond limiting individual women, the women's health gap directly affects the global economy by impairing women's economic participation and productivity. Chronic diseases are often linked to extended absences from work, and poor health also causes "presenteeism", where individuals cannot perform at their full capacity, reducing productivity. Finally, informal caregiving obligations and disabilities can limit affected individuals from full workforce participation.

The health disparities outlined in this report affect individuals of all age groups, with about 50% of the burden impacting women of working age. Women with fewer health conditions could add 1.7% in GDP. Comparatively, if the status quo remained, the World Bank estimates an annual GDP growth of 2.7%, 2.9% and 3.4% for 2023, 2024 and 2025, respectively. Looking at the different channels affecting GDP, the largest impact would also be created through fewer health conditions, amounting to around $400 billion, or avoiding 24 million years lived with disability. Expanded participation and increased productivity contribute more than 20% of total impact.

On a global level, there are 10 conditions, such as premenstrual syndrome (PMS), depressive symptoms and migraines, that, if addressed, could make up more than 50% of the economic impact. This indicates which conditions could be prioritized globally. For example, addressing PMS has the potential to contribute $115 billion to the global economy. Rather than defaulting to PMS being a "part of life", there are ways to manage symptoms. A 2020 analysis found that women who took calcium supplements experienced fewer PMS symptoms, such as anxiety or water retention, than women who took a placebo. A study in Iran found that the severity and frequency of PMS symptoms was significantly lower in an intervention group that offered education and coping strategies. By addressing PMS with effective interventions, women could experience less pain, experience better quality of life and feel more able to work. Regional disease burden and healthcare status will lead to conditions having the greatest economic impact in different countries. When examining economic impact, rather than DALY impact, more weight is given to conditions that affect people during years of working age, as that is when economic contribution is highest. Conditions such as ischaemic heart disease may affect more people, but if the burden of morbidity and premature mortality happens after the usual age of retirement, the economic impact is more limited. Additionally, other conditions not listed could be the underlying cause for the top 10 conditions. For example, infertility can lead to significant anxiety, depression symptoms and other psychological distress.

Investing in women's health shows positive return on investment (ROI): Investing in improving women's health not only improves women's quality of life but also enables them to participate more actively in the workforce and make a living. The potential value created

through women's higher economic participation and productivity exceeds the costs of implementation by a ratio of $3 to $1 globally. This estimate is based on the net annual costs associated with the additional uptake of interventions required to address the women's health gap, including all relevant interventions considered cost-effective in each setting. The analysis compared this to the additional economic potential that could be unlocked by the health improvements associated with these interventions. The expected economic return is greatest in higher-income settings, where the ratio is around $3.5 returned to $1 invested. More investment is probably needed in some LICs to establish the basic health infrastructure required to support low-cost delivery of high-quality health services, as well as to create better and more rewarding economic opportunities for women. Still, the analysis indicates that the overall benefit would exceed the costs even in these settings, at a rate of around $2 returned to $1 invested. The analysis examines only the direct costs of addressing the gaps in care delivery identified. In the longer term, a range of greater positive returns is possible, given that improvement in the lives of women influences the heath and resilience of their families and communities.

The analyses and findings provide indications on where to start tackling the women's health gap, reaping the highest benefit for all Globally, the top 10 conditions by economic impact account for more than 50% of the total GDP impact. This highlights areas with high unmet needs and potential, aiding decision-makers in prioritizing efforts to address health disparities. Specific conditions and their socioeconomic contexts vary among regions, influencing their contribution to the economy. This information could guide tailored strategies towards health equity. The content and sequence of each action will need to be tailored to the regional conditions. Building on the knowledge developed throughout this report, a fact-based strategic assessment can lead to better health equity for each country.

Call to action: How to close the women's health gap

Women's health has been under-researched and women face different challenges from men in affordability and access to treatment. This health gap creates unnecessary suffering and preventable economic losses. It does not have to be this way. Through collaborative efforts on five fronts, a more equitable and healthy future is possible. There is an opportunity to close the women's health gap by (1) investing in women-centric R&D, (2) strengthening the collection and analysis of sex- and gender-disaggregated data, (3) enhancing access to gender-specific care, (4) encouraging investments in women's health innovation and (5) examining business policies to support women.

The women's health gap could be narrowed by increasing funding to achieve equality with investments in funding for men's health and from protocols that set standards of equity and diversity. Scientists, life science companies (pharma, biotech, MedTech), healthcare providers and others in the healthcare ecosystem may consider how the traditional understanding of disease is focused primarily on the male body. A more in-depth understanding of these differences would enable more effective care interventions and improved health outcomes. One example of venture capital-backed funding addressing this disparity is Repro Grants, which allots up to $100,000 for research projects aimed at deepening understanding of female reproductive biology. For conditions that affect women differently or disproportionately, more effective interventions start with clinical trials designed with inclusivity at their core, informed by preclinical research using female animal models. Specifically, there should be stronger diversity, equity and inclusion guidelines for clinical trial design. Guidance could incorporate male versus female disease prevalence mix and use sex-specific thresholds for biomarkers, to yield an adequate patient representation in clinical trials. Equitable representation by prevalence also implies more diverse research organizations. Life science companies, academic institutions and educational bodies should ensure that women and people of colour not only find representation but are actively involved in research, leadership and decision-making roles. For example, women form almost 70% of the global health and social workforce but it is estimated they hold only 25% of senior roles. The benefits of increasing women's representation are manifold: for example, teams boasting diverse gender representation have been associated with higher levels of accountability and effectiveness. In one study that analysed more than 440,000 medical patents filed from 1976 through to 2010, patented biomedical inventions created by women were up to 35% more likely to benefit women's health than biomedical inventions created by men. The patents from women were more likely to address women-specific conditions such as breast cancer and postpartum preeclampsia, as well as conditions that disproportionately affect women, such as lupus.

The prevalence of conditions such as endometriosis and menopause is underestimated, leading investors and life science companies to underestimate the market potential of these conditions and underinvest. By accurately assessing and reporting on the prevalence of such conditions, national health institutes and other authorities may direct additional funding to the research and treatment of these underserved conditions. Beyond epidemiological data, today's technology makes the systematic collection and analysis of sex-, race- and gender-disaggregated data simpler at all stages of the

R&D process. Life science companies could harness this capability to strengthen the collection, analysis and reporting of disaggregated data at each stage of the process. This approach to data has the potential to enable life sciences companies to evaluate the safety and efficacy of their pipeline products more accurately, including by adjusting formulations and dosages. This could yield better health outcomes and a higher probability of success. To further encourage the shift towards disaggregated data, the Women's Health Innovation Opportunity Map 2023 proposes establishing sex as a biological variable. This would enable national health departments and international health organizations to develop and enforce guidelines regarding disaggregation of data by sex and gender in research studies and health surveys. Biotech, MedTech and FemTech enterprises also have exciting opportunities related to AI and ML, which ensures that these models do not exacerbate existing biases or violate patient privacy rules. Developing robust, secure and holistic datasets could enable companies to differentiate in an overcrowded marketplace.

Enhance access to gender-specific care, from prevention to diagnosis and treatment

Women deserve the same high-quality level of care from their healthcare providers as men, which doesn't mean the same care per se. There is a pressing need to redesign medical curricula as well as residency and fellowships to reflect sex and gender differences. In addition to medical schools, continuing medical education organizations and credentialling entities could assess whether healthcare providers are receiving the latest information and training on the women's health gap and sex- and gender-based differences. Current and future healthcare professionals of all specialties must be equipped with accurate and updated knowledge of biological differences, including sex-specific manifestations of symptoms. Future certification or tests could include questions meant to address whether providers have internalized this knowledge. Next, the path to excellence in clinical care lies in acknowledging and rectifying inherent equity disparities. Gender- and sex-responsive services benefit patients, healthcare providers and society at large. Health systems could implement new guidelines and protocols (for example, sex-specific cut-offs for biomarkers, discharge checklists) to guide decision-making and minimize biases. Similarly, life science companies could include sex-specific evidence and outcomes on product package inserts/labels to inform healthcare professionals on the best regimen for different subpopulations.

To reduce maternal mortality globally, investing in the training and upskilling of midwives could save an estimated 4.3 million lives per year and prevent roughly two-thirds of maternal deaths, 64% of newborn deaths and 65% of stillbirths while contributing to the economic development and empowerment of women. Governments, educational bodies, philanthropic institutions and many other stakeholders can use this moment to raise awareness of the sex-specific manifestations of disease – for example, ensuring that newly diagnosed endometriosis patients have access to up-to-date resources, including which trials they could potentially participate in. Healthcare entities, philanthropic organizations or community health workers could start or reinvigorate in-person support groups for conditions such as endometriosis or menopause, or for mental health support. Collectively, better education and resources, plus new diagnostics, are among the ways to potentially elevate the quality of healthcare women receive.

Historically, given lower levers of investments overall for women's health under the traditional financing model schemes, new financing models have a critical role to play. These models can accelerate innovation: one example is the Advance Market Commitment (AMC) geared at COVID-19 vaccine development and deployment. Research and reliable data on the women's health landscape can help spur investment. For investors, the gender-based healthcare landscape presents a mosaic of unexplored opportunities. By pivoting towards these opportunities, they can channel funds into high-impact areas, bridge the data gap and enable more investment and innovation. Governments could explore policies that encourage sex- and gender-responsive health research and services; for example, by earmarking funding, providing tax incentives, lowering application fees, expediting the drug approval process and more. Philanthropic organizations, donors and international bodies could offer grants and prizes at a national or local level to spur innovation, while supporting capacity-building in regions where gender-based health disparities are highest. Examples might be launching a grant or award programme geared towards reducing rates of respiratory illnesses in areas where there is a high percentage of women smokers, or towards a technology-based solution for women in vulnerable populations to access transportation to healthcare services. Private-sector stakeholders could help develop new financial products and investment vehicles, such as gender-lens investing, to attract capital towards projects that directly address the women's health gap. Governments could further promote private-sector investments by creating tax incentive programmes for angel investors and venture capitalists that invest in women's health. With collaboration, stakeholders have the potential to encourage investments and inspire the development of innovative financing models in women's health.

Establish business policies that support women's health

Healthcare disparities also lead to economic losses due to absenteeism, presenteeism and reduced productivity overall. Employers could consider how their workplace policies and benefits support women's health, examine ways to better involve women in decision-making processes, provide health and wellness benefits that support women's health and create safe working environments in which women can speak openly about their health needs. By better understanding employee demographics, employers could invest in the areas with higher impact and potential (for example, if a workforce includes women between 45 and 55 years old, flexible work policies that recognize menopause could help many employees). Given the fact that women are more than twice as likely as men to have depressive symptoms in their lifetime,128 employers may explore how mental-health programmes can help employees find evidence-based mental health resources that meet their needs. Often, leaders create change in the workplace based on their own experiences, knowledge or vision. If the decision-makers are predominantly men, the workplace tends to benefit men. McKinsey research has found a "broken rung" in women's advancement throughout industries: for every 100 men promoted from entry-level to manager roles, 87 women are promoted and only 73 women of colour are promoted. Overall, due to gender disparities in early promotions, men end up with 60% of manager-level positions in a typical company. More women in senior leadership positions may be able to advocate for policies that support women's health, and companies may ultimately benefit from a healthier and more productive workforce. Data-driven, scalable actions to improve women's health may vary widely, but the critical component is to determine how each stakeholder can contribute to narrowing the gap.

Conclusion

There is a moral imperative to address the women's health gap and improve the lives and livelihoods of billions of women worldwide. If health equity efforts sit within a tree of principles, they can be watered by research, flourish in the sun of business investments and grow far-reaching branches that stretch into the economy. Achieving health equity is a collaborative and ongoing endeavour that relies on the active participation of governments, healthcare institutions, non-governmental organizations, individuals and all stakeholders vested in this cause. Tackling the women's health gap depends on addressing the interconnected factors outlined in this report: the deficit in women-specific knowledge in science, the glaring data gaps, the disparities in healthcare delivery and the insufficient investment in women's health. Recognizing the vast potential to improve the lives and livelihoods of half the global population while boosting the economy serves as the catalyst for closing the women's health gap. Every facet of this gap, from limited education to suboptimal treatments, offers an opportunity for transformation with the active involvement of governments, life science innovators, educational institutions, philanthropists, activists and more. In this endeavour, there lies an opportunity of $1 trillion in economic potential driven by improved women's health and economic participation. The question is not whether this wealth of opportunities exists but rather who will take the initiative to seize it and drive change. Women's health is not a standalone issue – it is a cornerstone of societal well-being and progress. Better health and well-being for women creates a ripple effect that extends to families, communities and nations. This holistic approach, supported by collective action and sustained investment, will not only narrow the health gap but also contribute to the betterment of a shared global future.

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