

In collaboration with the
McKinsey Health Institute



Closing the Women's Health Gap: A \$1 Trillion Opportunity to Improve Lives and Economies

INSIGHT REPORT

JANUARY 2024



Contents

Foreword	3
Executive summary	4
Introduction	5
1. The role of science in addressing health disparities	9
2. Data gaps underestimate women's health burden, limiting innovation and investment	13
3. Creating sex- and gender-responsive care delivery systems	16
4. Directing investments towards women's health	20
5. Closing the women's health gap could boost the global economy	24
6. Call to action: How to close the women's health gap	30
Conclusion	34
Contributors	35
Endnotes	36

Disclaimer

This document is published by the World Economic Forum as a contribution to a project, insight area or interaction. The findings, interpretations and conclusions expressed herein are a result of a collaborative process facilitated and endorsed by the World Economic Forum but whose results do not necessarily represent the views of the World Economic Forum, nor the entirety of its Members, Partners or other stakeholders.

© 2024 World Economic Forum. All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, including photocopying and recording, or by any information storage and retrieval system.

Foreword



Lucy Pérez
Senior Partner, McKinsey & Company; Affiliated Leader, McKinsey Health Institute, USA



Shyam Bishen
Head, Centre for Health and Healthcare; Member of the Executive Committee, World Economic Forum

For all the efforts to improve gender equity over the past century, the gap between men's health and women's health remains wide, whether it's in research, data, care or investment.

And every person on the planet is affected by the women's health gap, whether they know it or not. When we consider the impact of closing the gap, we are not just talking about women's lives, but those of people we love, our communities and the world at large.

We know it's possible to reach equity in health for men and women. In this report, *Closing the Women's Health Gap: A \$1 Trillion Opportunity to Improve Lives and Economies*, we're pleased to showcase how the narrowing of the women's health gap would allow 3.9 billion women to live healthier, higher-quality lives. It could also allow at least \$1 trillion to be pumped into economic productivity annually, which reflects how narrowing the gap would lead to fewer early deaths, fewer health conditions, extended economic and societal capacity to contribute, and increased productivity. Of that, the largest impact would be created from women having fewer health conditions, letting them avoid 24 million life years lost due to disability and boosting economic productivity by up to \$400 billion.

Women's health encompasses more than women-specific conditions, and achieving health equity is

possible with intentional, coordinated efforts. While there are many ways, large and small, for a wide range of organizations to improve women's health, specific actions could create meaningful impact. Among these are investing in women-centric research; collecting and analysing sex-, ethnicity- and gender-specific data; enhancing access to gender-specific care; creating incentives for new financing models; and establishing business policies that support women's health and strengthen women's representation in decision-making.

We invite leaders from the public, social and private sectors to review this report and find ways to bring their own contributions to filling the gap in women's health outlined here. We are excited to see recent momentum in addressing this gap, such as the debut of the Women's Health Innovation Opportunity Map;¹ the recent creation of the White House Initiative on Women's Health Research; the launch of the Women's Health Interest Group from the *European Institute of Women's Health*; and news that Australia is on track to become one of the first countries to eliminate cervical cancer.

In this multi-year research effort, the analysis backs up one of the core beliefs of everyone involved: that we all have a role to play in improving women's lives. As Nobel Prize winner Malala Yousafzai once said, "We cannot succeed when half of us are held back."

Executive summary

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,² 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.

In this report, women's health is defined as biological conditions and general health conditions that often affect women uniquely, differently or disproportionately. There are many efforts to improve women's health globally; however, this report focuses on the economic implications of the women's health gap and the business case for closing it.

The root causes of the gap

There are four primary areas that need to be addressed to close the health gap:

- 1. Science:** The study of human biology defaults to the male body, which hinders understanding of sex-based biological differences and results in fewer available and less effective treatments for women.
- 2. Data:** Health burdens for women are systematically underestimated, with datasets that exclude or undervalue important conditions.
- 3. Care delivery:** Women are more likely to face barriers to care, and experience diagnostic delays and/or suboptimal treatment.

- 4. Investment:** There has been lower investment in women's health conditions relative to their prevalence. This drives a reinforcing cycle of weaker scientific understanding about women's bodies and limited data to de-risk new 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.

Charting the way forward

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 workplaces.

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.

Introduction

Women spend 25% more time in “poor health” than men.

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.

BOX 1: Terminology

This report reflects women’s health as a market segment. The authors acknowledge the importance of healthcare to the transgender, non-binary and gender-fluid communities, and that not all people who identify as women are born biologically female.

The authors have often used the term “sex and gender” to reflect inclusive language and recognize the need for future research into health issues that

is inclusive of the transgender, non-binary and gender-fluid communities. They also acknowledge the profound differences for women based on factors such as race, ethnicity, socioeconomic status, disability, age and sexual orientation. Additional work and research should reflect how to tackle these barriers alongside the overall women’s health gap. In this report, the term “woman” includes those under age 18.

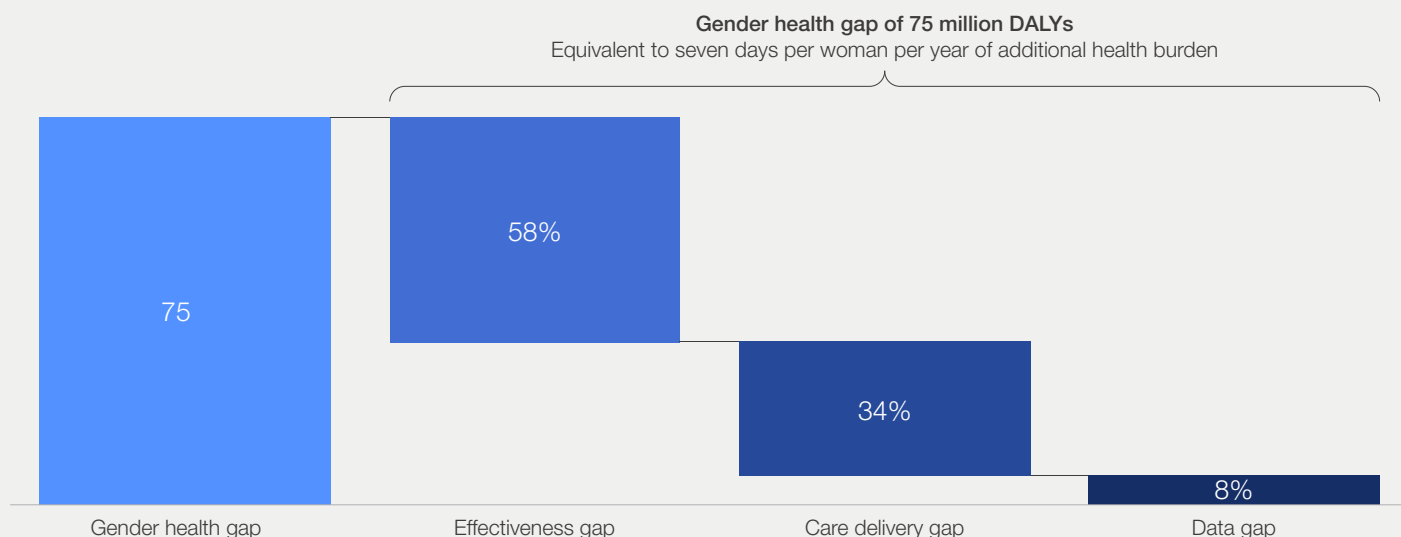
Building on previous work from the McKinsey Health Institute and the McKinsey Global Institute,⁵ analysts quantified this health gap in terms of disability-adjusted life years (DALYs),⁶ and the extent to which this difference is due to the structural/systematic barriers women face (Box 2, “Research methodology”). 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 (Figure 1), 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 2040.⁷ 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.

FIGURE 1: | The women's health gap 2040



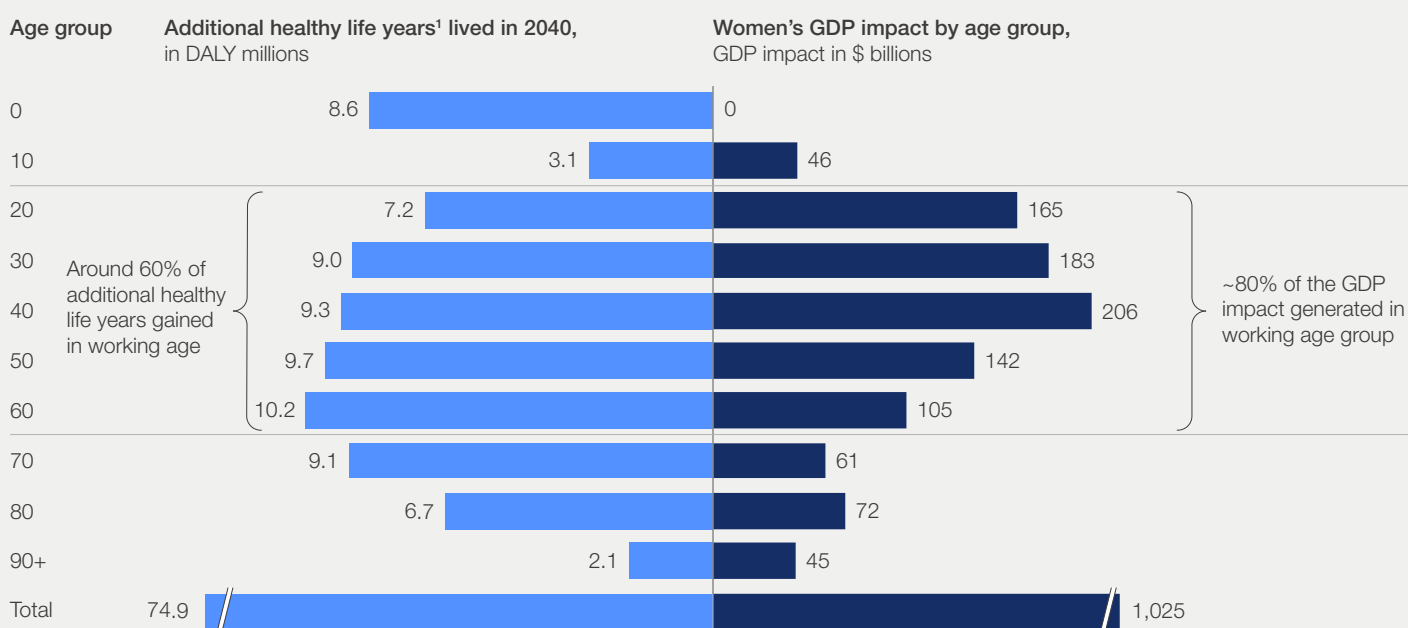
Note: Missed value from undercounting was calculated by adding the underestimated disease burden for endometriosis (difference between real endometriosis disease burden based on WHO prevalence and IHME disease weight and IHME reported endometriosis burden) and menopause (difference between real disease burden based on prevalence sizing and PMS disease weight).

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

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 (Figure 2).

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



1. Additional healthy life years of women by closing the gender health gap by 2040.

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

Embracing the full definition of women's health

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,⁹ 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 (Figure 3). 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 (Figure 4).

FIGURE 3: Total global women's health burden

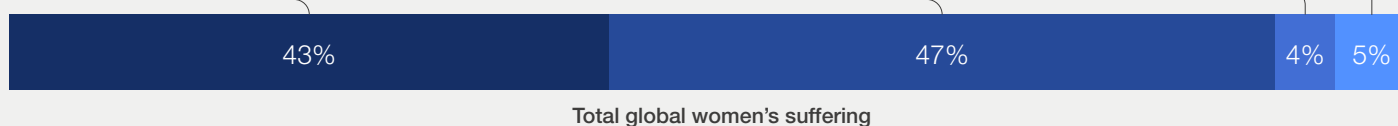
Breakdown of conditions, %

43% are **conditions that neither affect women disproportionately nor differently** (e.g. ischaemic heart disease, tuberculosis)

47% are related to **conditions that affect women disproportionately** (e.g. headache disorders, autoimmune disease, depression)¹

4% are related to **conditions that affect women differently** (e.g. atrial fibrillation, colon cancer)²

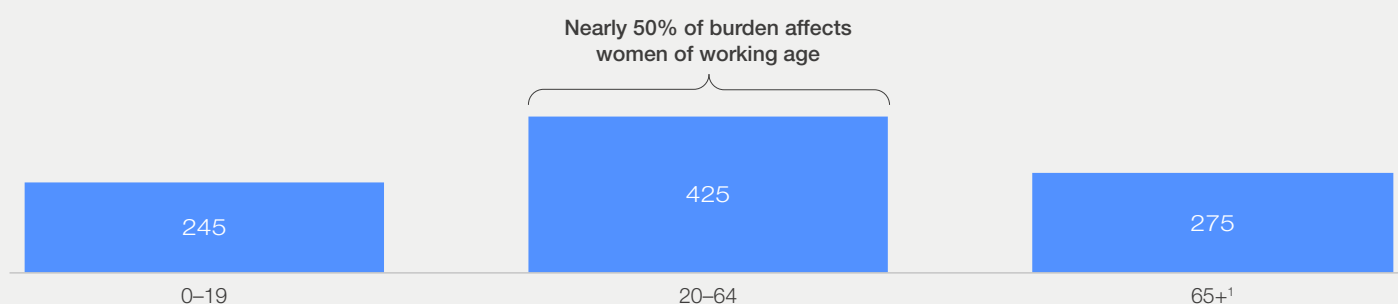
5% are related to **women-specific conditions** (maternal and gynaecological)³



1. Conditions that affect women disproportionately are defined as conditions with a higher prevalence in women compared to men but not a higher disease burden per case. **2.** Conditions that affect women differently are defined as conditions with a higher disease burden per case in women compared to men. **3.** Including maternal conditions such as maternal haemorrhage, maternal sepsis and other maternal infections, hypertensive disorders of pregnancy, obstructed labour and uterine rupture, abortion and miscarriage, ectopic pregnancy, indirect maternal deaths, late maternal deaths, maternal deaths aggravated by HIV/AIDS, gynaecological diseases such as uterine fibroids, polycystic ovarian syndrome, women's infertility, endometriosis, genital prolapse, premenstrual syndrome and women's-specific cancers such as uterine cancer, ovarian cancer and cervical cancer.

Source: McKinsey analysis based on the University of Washington's Institute for Health Metrics and Evaluation, "Global Burden of Disease Study 2019", women's health model, used with permission

FIGURE 4: How health burdens affect women over their lives



1. In 2016 the average pension age for a woman retiring that year was 63.7 years.

Source: Disease burden from University of Washington's Institute for Health Metrics and Evaluation, "Global Burden of Disease Study 2019", used with permission; OECD, "Current Retirement Ages", Pensions at a Glance, OECD and G20 Indicators, OECD Publishing, 2017

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).¹¹ 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.

BOX 2: Research methodology

Assessment of the women's health gap and the potential to reduce it:

Analysts used the Global Burden of Disease data from the University of Washington's Institute for Health Metrics and Evaluation (IHME) to forecast disease burdens up to 2040. This includes diseases leading to death and poor health conditions such as infectious diseases and chronic conditions.

To gauge how much the disease burden could be reduced, McKinsey thoroughly reviewed clinical evidence for the top 64 diseases affecting women, which account for nearly 86% of the global disease burden.¹² It focused on around 180 interventions, based on guidelines from leading institutions such as the World Health Organization (WHO) and *The Lancet*.

For each intervention related to the 64 diseases, McKinsey examined the following factors:

- Identification of potential reduction of morbidity and mortality,¹³ scaled up to all diseases, considering the differences between men and women to identify the women's health gap
- Projection of total population and working population baselines with the expansion from health interventions and labour-force capacity interventions
- Estimation of the duration to realize the full benefits, considering both implementation time and the lag before health benefits appear

Cases with limited adoption data and correlated assumptions are detailed in the [technical appendix](#).

Quantification of the economic impact:

To determine the potential economic effects of the proposed health interventions, analysts used population¹⁴ and labour force¹⁵ predictions up to

2040. These health gains were converted into labour force involvement, productivity and economic gains through four avenues: fewer early deaths; fewer health conditions; extended economic capacity to contribute; and increased productivity. The assumptions for estimating the impacts were based on academic studies and verified by experts.

This analysis acknowledges:

- Disease burden evolution: Unexpected events such as COVID-19 can change projections. The IHME's disease burden data reflects the best available data.
- Intervention effectiveness: Given that evolving scientific evidence may be inconclusive, the research included input from academic and clinical experts.
- Future innovations: McKinsey focused on advanced-stage technologies and consulted field experts.
- Addressing the women's health gap: Analysts assumed that if existing interventions are more effective for or more frequently adopted by men, the same rates could be achieved for women. If gender-based efficacy wasn't monitored, it was assumed a similar gender gap to the ones for which data was available.
- Economic implications: This economic analysis makes assumptions about labour market choices. For instance, how age and health affect labour force participation. Evidence such as current labour force statistics and potential labour market changes were considered.
- Data gap: Undercounting and undervaluing of diseases and their health burden on women likely leads to an underestimation of the women's health gap.

How to read this report

The analysis presented in this report includes an assessment of the health burden associated with the women's health gap as measured in potential years of healthy life.¹⁶ This health improvement potential was then translated to economic potential, measured as contribution to gross domestic product (GDP). Sections 2–4 of this report are focused on health improvement potential (measured in DALYs), broken down by three root causes related to disparities in science, data and care delivery. The economic value of this combined health improvement potential is presented in section 6, where economic impact is measured in additional GDP. While this report focuses on the potential economic benefits of closing the women's health gap, there is also a moral imperative to close the women's health gap and to improve the lives of millions of women worldwide.

1

The role of science in addressing health disparities

Inequality hinders knowledge.



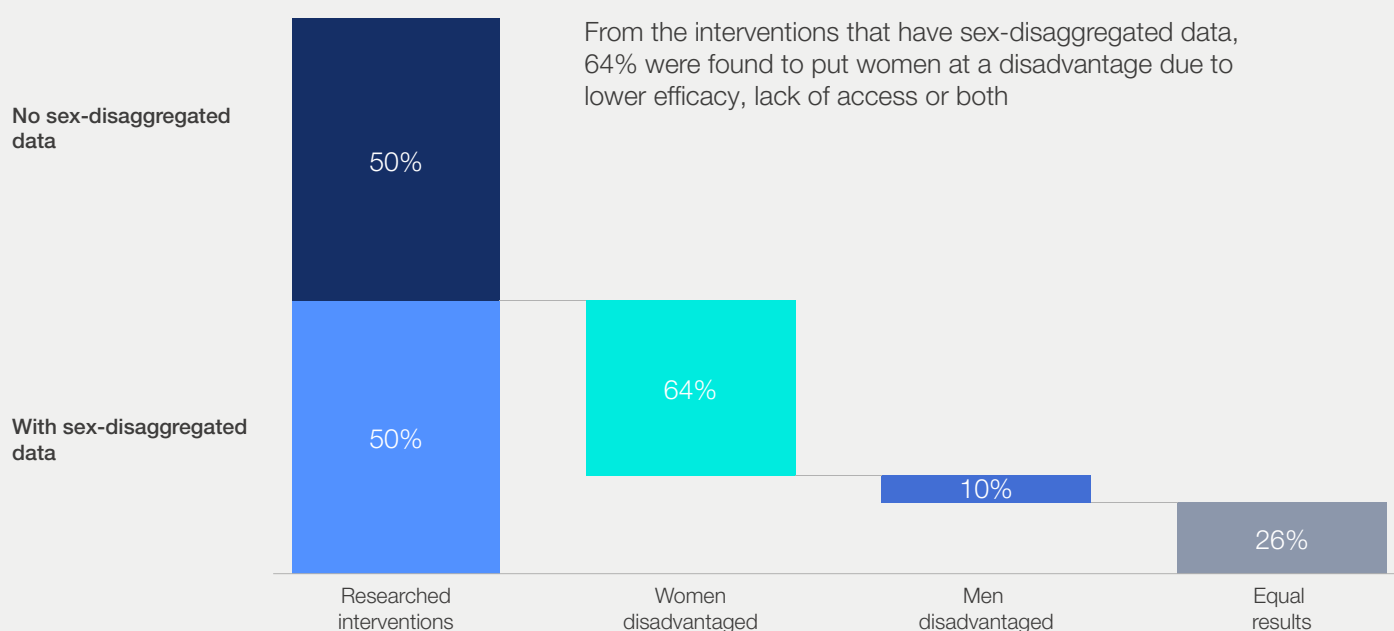
Biomedical innovation builds on the basic understanding of science around body function and the cellular and molecular pathways involved in disease development and progression. Historically, men have both led and been the subject of the study of medicine and biology.¹⁷ The majority of animal models have been based on male specimens.¹⁸ 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").¹⁹

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. (Figure 5).

FIGURE 5: Effectiveness of and access to interventions vary between men and women



Source: McKinsey analysis

Examples include:

- 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.²⁰ 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.²¹

- 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.²² 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.²³

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 (Figure 6). 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

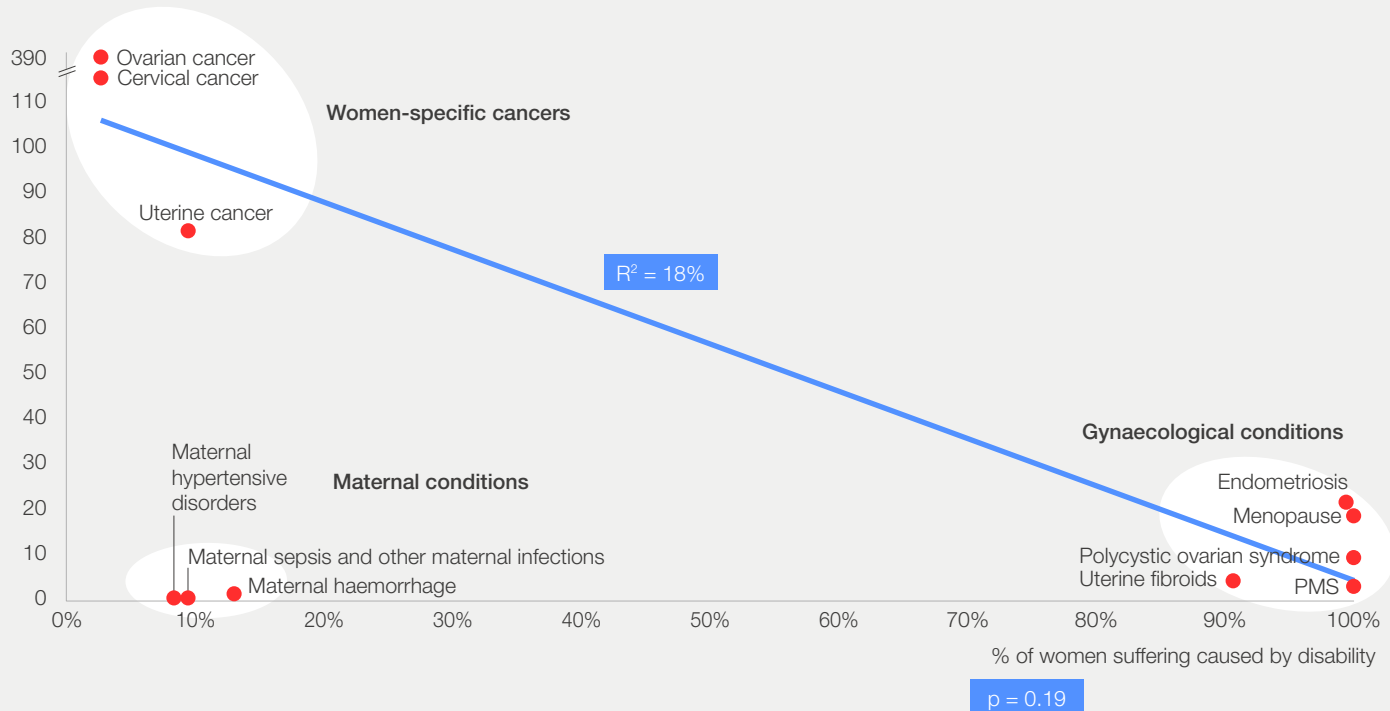
and polycystic ovary syndrome. Additionally, maternal conditions should receive more attention: while they contribute a similar share to overall suffering among women compared to women-specific cancers, there is a large discrepancy in the pipeline of therapies in development. For example, even though 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.²⁴

In all, when tackling women's health, the solution is not to divide more slices of one pie: it's to make more pie.

FIGURE 6: Pipeline assets for women-specific conditions by disease group

Assets in current pharma pipelines, number of assets vs. contribution to women suffering by disability (years lived in disability, or YLD) in %

Assets currently in pipeline (preregistration to phase III)



Note: Includes pipeline of assets (including the assets that have previously been approved for other conditions) across 67 conditions, mapped to their respective years of life lost rate and years of life lived with disability rate from the Global Burden of Disease dataset.

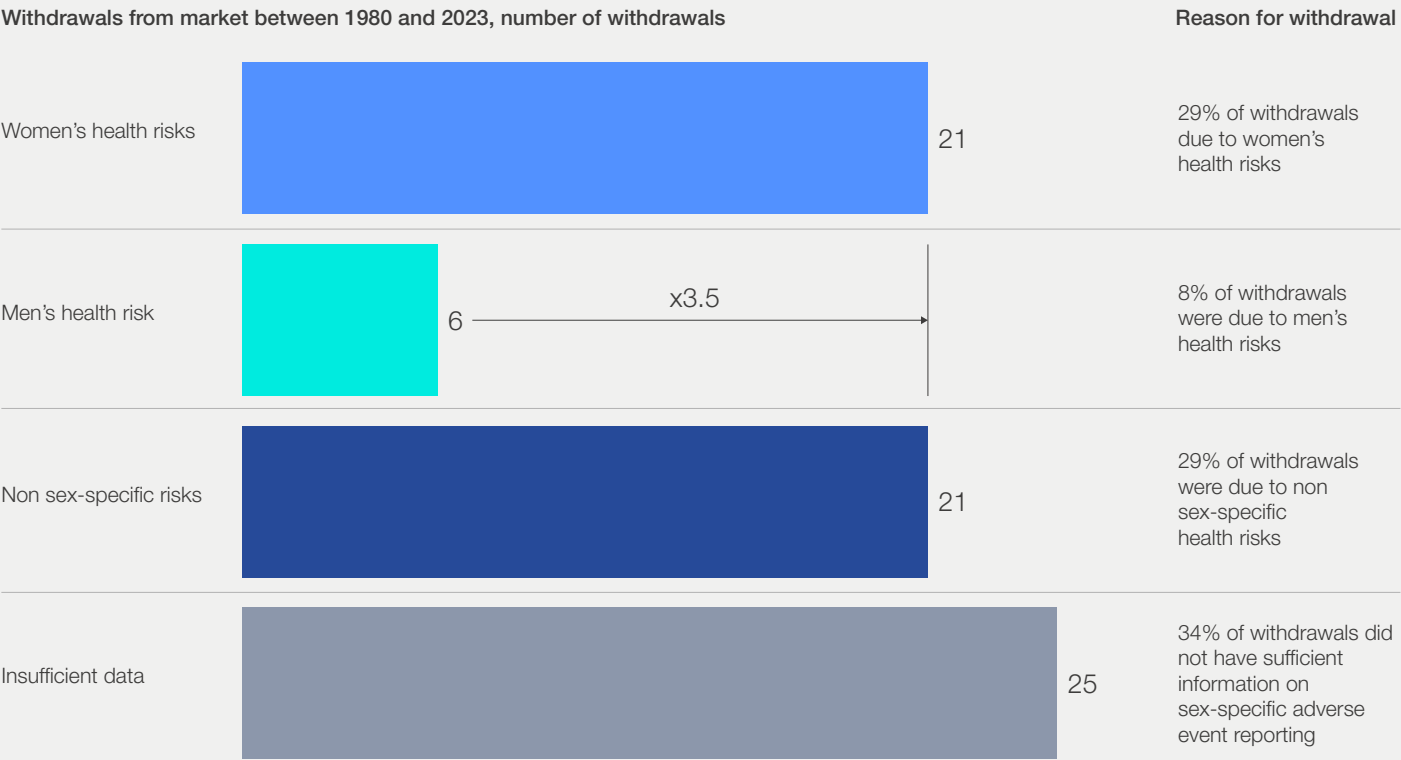
Source: Pharma Projects, University of Washington's Institute for Health Metrics and Evaluation, "Global Burden of Disease Study 2019", used with permission

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.²⁵

Healthcare professionals in the United States reported 4.4 million serious or fatal events for women versus 3.8 million for men in 2022.²⁶ 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 (Figure 7).

FIGURE 7: Global drug withdrawals by type of risk, 1980–2023



Note: Withdrawals for safety and adverse events were categorized by the risk to women, men or non sex-specific. Health risk was judged by the number of sex-reported adverse events, the number of men vs. women adversely affected by the drug based on % in trial, or higher rates of drug prescribed to men vs. women.

Source: Pharmaprojects (global drug withdrawals from 1980–2023); press search

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 (Figure 1). 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.

2

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

Health data gaps diminish and skew the picture of women's health.



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.²⁷ 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 underinvestigated and undertreated, with implications for clinical and psychological outcomes.²⁸ Collectively, these incomplete datasets can influence decision-making and have the potential to exacerbate the women's health gap.

Gaps exist across the data value chain

Stage 1: Pre-data generation²⁹

The data gap starts at the very definition of women's health: there is a lack of consistent and aligned definitions and measurement scales for conditions and symptoms affecting women. For example, there are different definitions of health-related burden associated with menopause or menstrual syndromes, and a lack of consistency in pain instruments and scales.

Stage 2: Data generation

This encompasses both epidemiological and clinical data, including the documentation of women's specific symptoms and markers for diagnosis. There is little understanding of how some diseases manifest differently in women and a lack of data on the health-related burden associated with some women-specific conditions. For example, in the United States, 4% of healthcare-related R&D efforts are targeted specifically at women's health issues.³⁰

Stage 3: Data aggregation

Sex-disaggregated results are available in the public domain for only 50% of the interventions analysed. One study found that a quarter of clinical trials in the US had sex-disaggregated data. Further, clinical trial designs and end-point selection can fail to consider potential differences between sexes. Evidence for intervention effectiveness may be drawn from unrepresentative populations due to failure to recruit adequate numbers of women (and minorities). In another, in 2021, half of countries reported COVID-19 cases and deaths by sex, 14% reported COVID-19 hospitalizations by sex and 10% reported COVID-19 intensive care unit admission by sex.³¹

Stage 4: Data analysis

The metrics selected for analysis and publication may hide or dilute the experience of specific groups compared to others, and datasets gathered during the digital age have led to growth in machine-learning (ML) algorithms. Neither this data nor the programs applied to it are de facto neutral. Without guardrails to protect equity, this technology could perpetuate structural disparities. Artificial intelligence (AI) experts have suggested that using counterfactual fairness and similar methods can mitigate bias in areas such as race and gender.³²

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 Denmark³³ 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.³⁴

Comparisons of endometriosis estimates also indicate unexplained variations. The WHO estimates that around 10% of women of reproductive age are living with endometriosis.³⁵ In contrast, the Global Burden of Disease estimates this figure to be 1–2%.³⁶ 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.³⁷ 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,³⁹ 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".⁴⁰ 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.⁴¹

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 2020 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.⁴²

Gaps in understanding the effectiveness of health interventions

One example of the gap in clinical evaluations can be seen in US clinical trials. The Food and Drug Administration (FDA) has had policies requiring investigation of gender differences in clinical evaluation of medicines since 1993,⁴³ and in clinical trials from 2000 to 2022 women's participation in oncology trials improved.⁴⁴ However, in comparing women's participation to their share of the disease burden, women remain under-represented in surgical trials for cancers of the bladder, head and neck, stomach and oesophagus.⁴⁵ While women experience a greater share of the health burden for some diseases, such as in neurology, the ratio is not reflected in clinical trial participation. Additionally, equitable representation of women (and men) of different races and ethnicities has long lagged.

BOX 3: Case study: COVID-19 vaccine development

In the race to develop a COVID-19 vaccine, a massive number of both experimental and observational clinical trials were needed. While representation of women was equal or better across trials, this was not reflected in consistent reporting of sex-specific results. One analysis found that when examining 41 articles on COVID-19 research, while 35 studies showed

safety data, only 12 of these presented data by sex or gender.⁴⁶ Less than 5% of investigators out of 2,500 COVID-19 studies had pre-planned for sex-disaggregated data analysis in their studies.⁴⁷ Where adverse effects and sex differences were published, adverse events were more common in women patients.⁴⁸

Ensuring sex-differentiated results

Today, only about 5% of trials report the number of participants by sex.⁴⁹ 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.

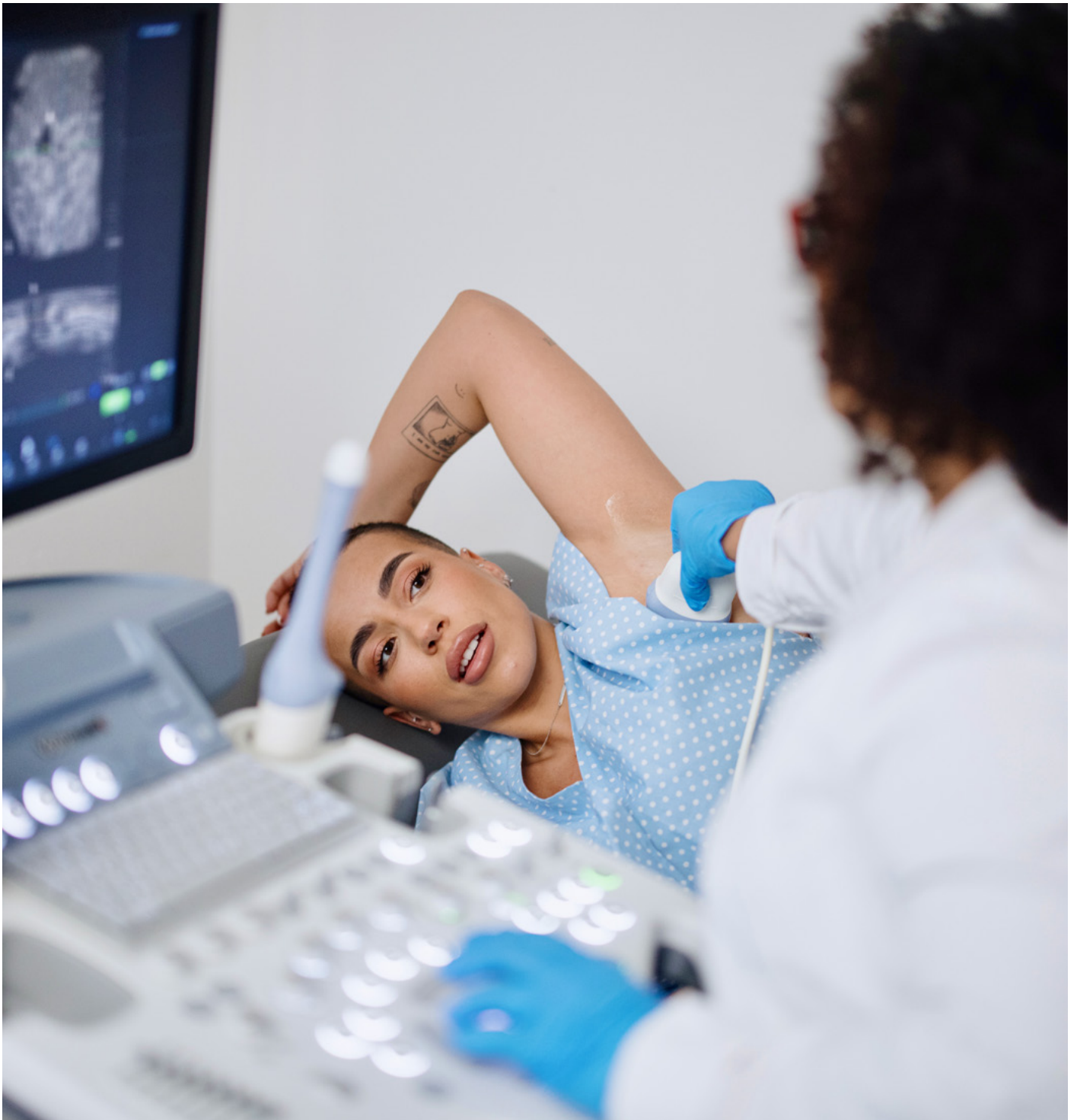
One route to start working with sex- and gender-specific data analysis in general is through meta-analytical techniques (i.e. combining study results to draw conclusions about therapeutic effectiveness) that can be used to analyse sex-specific efficacy without increasing sample size.⁵⁰ Other analysis has found that investing in women as investigators could lead to more women being enrolled in trials.⁵¹

Addressing data gaps in women's health would require concerted effort across multiple fronts,⁵² potentially including requiring sex- and gender-disaggregated data to further understanding.

3

Creating sex- and gender-responsive care delivery systems

Patients benefit from care delivery that reflects sex- and gender-specific needs.



Several studies have indicated that women are more frequent users of health services than men.⁵³ These differences, however, may be reduced substantially when adjusted for different levels of need, such as reproduction or differences in disease prevalence.⁵⁴ 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.⁵⁵ 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.⁵⁶ 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.⁵⁷ 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.⁵⁸

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.⁵⁹ 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.⁶² Similarly, Indian private insurers employ gender-based premiums, leading to higher expenses for women.⁶³ 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.⁶⁴ In Bangladesh, a study conducted by the HERproject showed that 73% of women missed work for an average six days a month in a textile factory.⁶⁵ 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 HERproject provided pads and other work-based interventions (sharing information regarding menstruation, reducing stigma, etc.), absenteeism dropped to 3%.⁶⁶

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.⁶⁷ 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".⁶⁸

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.⁶⁹

Women are
7x
 more likely than men to have a heart condition misdiagnosed or be discharged during a heart attack.

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.⁷⁰ More sensitive biomarkers to detect heart attacks in women have been identified,⁷¹ 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-risk⁷² 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.⁷³

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.⁷⁴

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 hand-off checklist; transfer to an immediately available catheterization lab; and a radial first approach to percutaneous coronary intervention.⁷⁵ A discharge checklist for guideline-directed medical therapy has been shown to reduce mortality in heart failure patients by 65% for both sexes.⁷⁶

While some efforts to achieve gender parity require heavy investment, there are budget-conscious solutions with potentially huge impact. UNICEF Côte d'Ivoire Country Office, for example, 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.⁷⁷

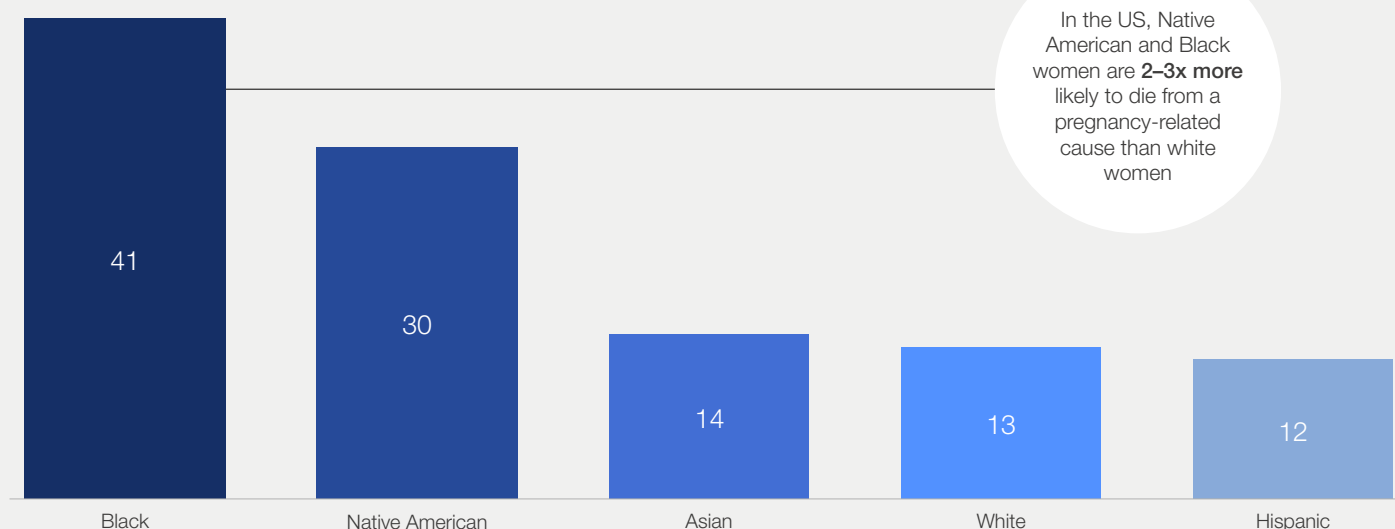
BOX 4: Intersectionality and health outcomes

This paper explores ways in which sex and gender influence an individual's health chances and experience of health services. These differences are all too often further exacerbated by overlapping levels of discrimination and disadvantage, such as race, ethnicity, socioeconomic status, disability, age and sexual orientation. The effects are strikingly clear in maternal health (Figure 8). Within the US, Native American and Black women are 2–3x more likely to die from a pregnancy-related cause than white women. For Black families, this holds true even

after adjustment for differences in income levels.⁷⁸ In India, a woman of upper caste is 3x more likely to use prenatal care and 5x more likely to have a trained birth attendant compared to a woman of lower caste.⁷⁹ A study in the UK indicated that women from ethnic minority backgrounds have an increased risk of post-partum haemorrhage.⁸⁰ On a global scale, 94% of pregnancy-related deaths occurred in low-resource settings, with 86% occurring in sub-Saharan Africa and Southern Asia.⁸¹

FIGURE 8: Disparities across ethnicities in maternal deaths in the US

Maternal deaths across ethnicities in the US, number of maternal deaths per 100,000 births



Sources: James, A.H., Federspiel, J.J. and Ahmadzia, H.K., "Disparities in Obstetrics Hemorrhage Outcomes"; US Centers for Disease Control and Prevention, "Racial/Ethnic Disparities in Pregnancy-Related Deaths – United States, 2007–2016"

Creating solutions to tackle care disparities

Overall, the gap in care delivery contributes 34% to the women's health gap (Figure 1). 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 programme⁶² and associated investment package.⁶³ 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 value-based 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.⁶⁴

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 2020.⁶⁵ 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.⁶⁶ 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.

4 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.⁸⁷ 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.⁸⁸ 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.⁸⁹ In Canada and the UK, 5.9% of grants between 2009 and 2020 looked at female-specific outcomes or women's health.⁹⁰

In another example, as of 2015 there were five times more scientific studies on erectile dysfunction than premenstrual syndrome.⁹¹ In a trial where the medication sildenafil citrate was shown to relieve menstrual pain, research stopped due to a lack of funding.⁹² 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.

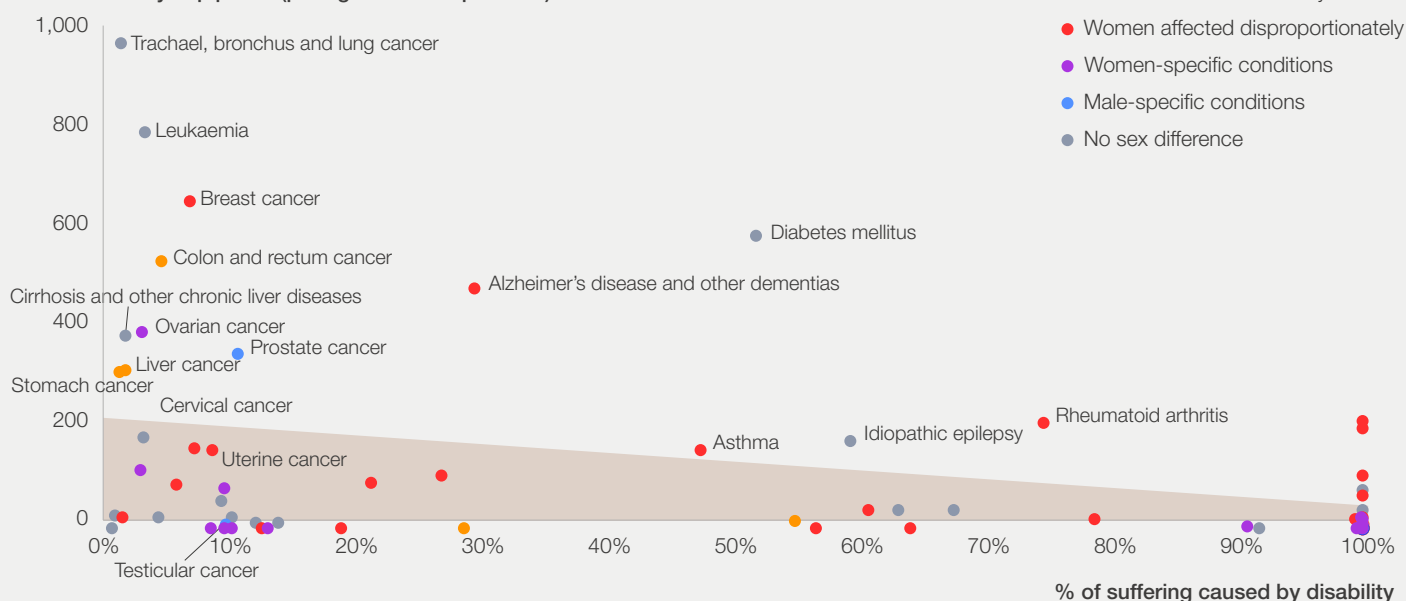
When governments and non-profits evaluate resources and policies across populations, they create an opportunity to advance health equity and benefit society. They could consider which investments reap the highest socioeconomic return, including in medical research. One example of targeted investment 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.⁹³

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

FIGURE 9: Comparison of current innovations in the pipeline

Comparison of current innovations in pipeline and share of suffering caused by disability¹

Assets currently in pipeline (preregistration to phase III)



1. $R^2 = 14\%$, $p < 0.005$ for % of suffering caused by disability.

Note: Includes pipeline of assets (including the assets that have previously been approved for other conditions) across 67 conditions, mapped to their respective YLL rate and YLD rate from the Global Burden of Disease dataset.

Source: Pharmaprojects (May 2023); University of Washington's Institute for Health Metrics and Evaluation, "Global Burden of Disease Study 2019", used with permission

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 (Figure 9).

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 1998.⁹⁵ By 2012, worldwide sales hit a record \$2.1 billion.⁹⁶ Given the similar prevalence and high unmet need for conditions such as endometriosis and menopause, there is enormous potential for innovative treatments (Box 5).

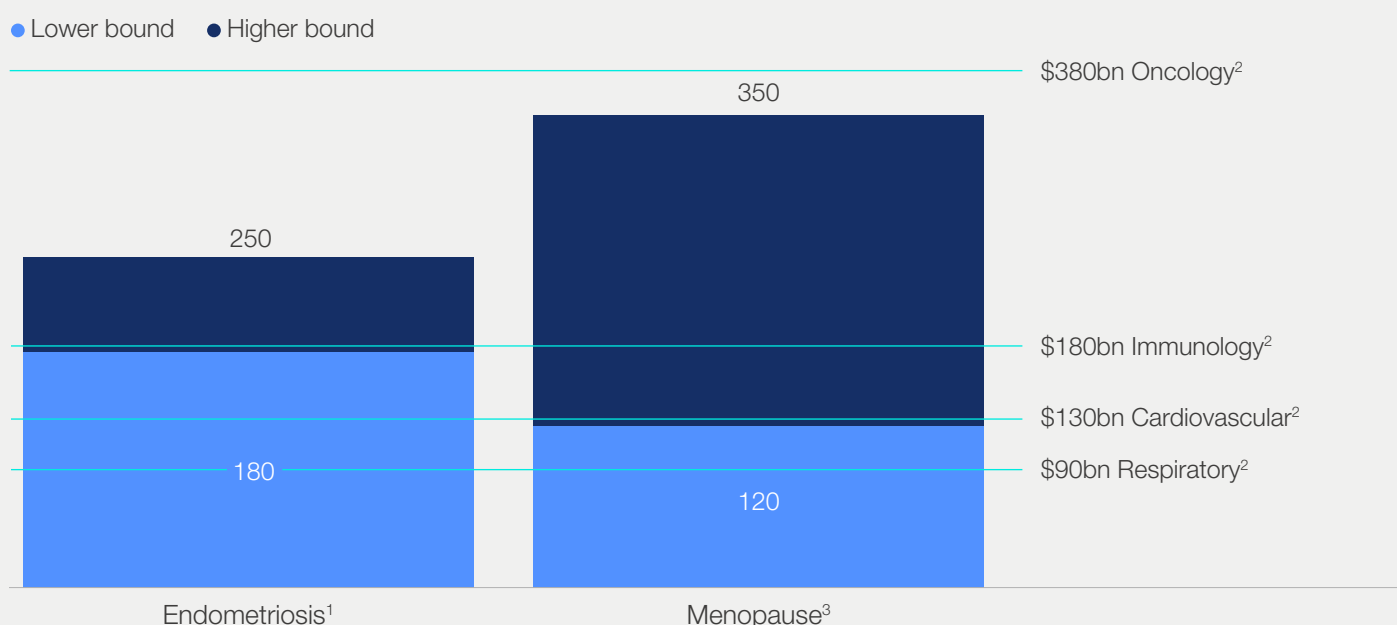
BOX 5: Endometriosis and menopause market potential

Globally, 190 million women⁹⁷ are suffering from endometriosis. Currently no cure exists and treatments focus on symptom management. Based on prevalence and high unmet need, the market potential for endometriosis treatments is estimated at \$180–220 billion globally (Figure 10) based on today's share of endometriosis patients seeking treatment. Innovation in this space, including faster diagnosis rates and earlier access to treatment, could increase the market potential.

Menopause is also an area of high unmet need globally. Based on the age distribution of the population and share of symptomatic cases, it is estimated that more than 450 million women worldwide have menopause or peri-menopause symptoms (Figure 10).⁹⁸ Based on the prevalence, the impact menopause has on women's life, the high unmet need and the share of women seeking treatment today, the estimated market potential for medication is \$120–\$230 billion globally.⁹⁹

FIGURE 10: Estimated global market potential for menopause and endometriosis

Endometriosis and menopause market potential compared to top four therapeutic areas by global annual spend, \$ billions



1. Market potential estimate for endometriosis treatments based on prevalence of 190 million women, existing unmet need and share of women on contraceptives and other medication to treat endometriosis was considered to determine targetable patient group. Share of endometriosis patients undergoing surgery and IVF was further considered to triangulate revenue. **2.** Global spend from projected spending 2027, IQVIA. **3.** Market potential estimate for menopause treatments based on prevalence of more than 450 million women, existing unmet need and share of women on HRT and other medication to treat menopause symptoms was considered to determine targetable patient group.

Source: Prevalence from WHO; Mecha, E.O., "Endometriosis among African Woman"; amount for women on treatment from Reproductive Fertility; Ellis, K., Munro, D. and Clarke, J., "Endometriosis is Undervalued: A Call to Action"; unmet need from The World Bank; prices of treatments from International Journal of Environmental Research and Public Health (doi: 10.3390/ijerph17134683) and additional press search; global spend from IQVIA

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).¹⁰⁰ There remains an opportunity to improve outcomes of breast cancer in LMICs, where the fatality rate – 72% – was higher than the incidence rate (62%).¹⁰¹ Globally, endometriosis, uterine fibroids and menopause are among the conditions with high unmet need and economic potential.

Private equity/venture capital investors are increasing investments in women's health, with excitement about digital health solutions

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.¹⁰² Within the FemTech space, there is a concentration of activity concerning maternal health patient support,

consumer menstrual products, gynaecological devices and fertility solutions.¹⁰³

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.¹⁰⁴

Digital health is another potential avenue for innovation, with the potential to make health more equitable.¹⁰⁵ In the digital healthcare space, FemTech companies received 3% of the total digital health funding.¹⁰⁶

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.

5

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

Data indicates a potential \$1 trillion increase annually by 2040.



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.

Women's economic participation has been and will be a major driver of economic growth

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.¹⁰⁸ 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.¹⁰⁹ Addressing the gap could generate the equivalent impact of 137 million women accessing full-time

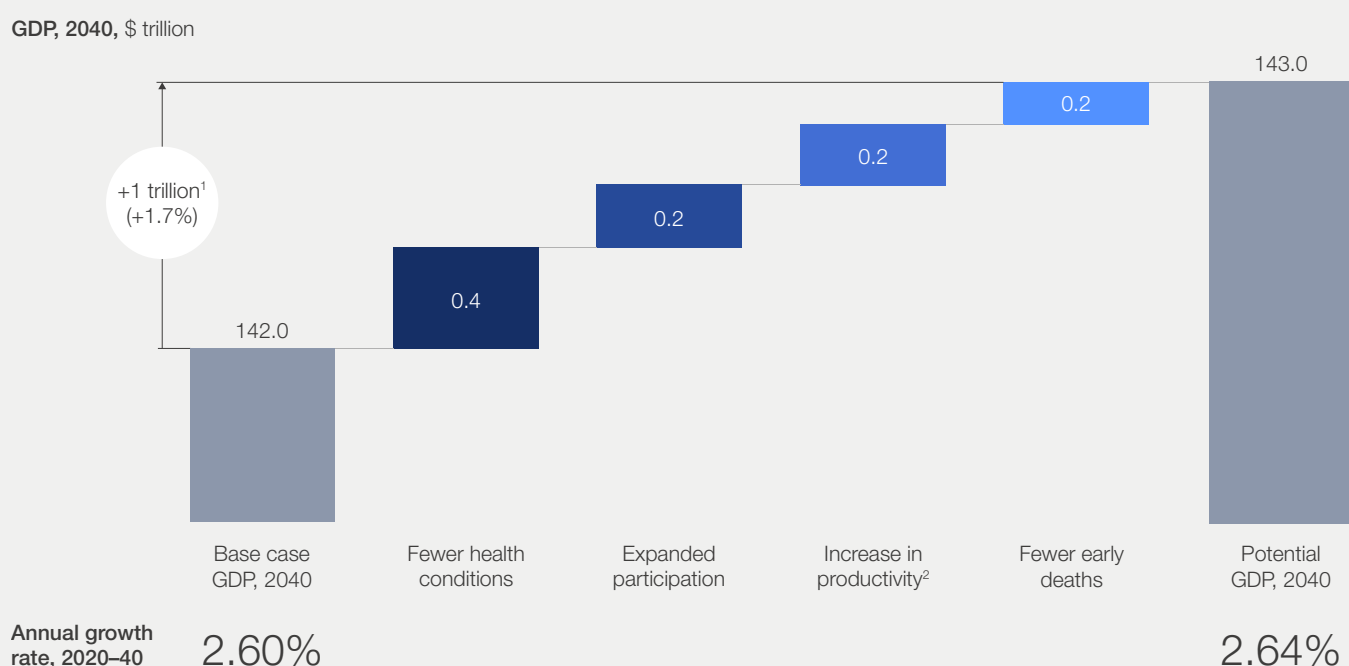
positions by 2040. This would enable women to secure an income to support themselves and their families and has the potential to lift more women out of poverty. Beyond limiting individual women, the women's health gap directly affects the global economy by impairing women's economic participation and productivity. Chronic diseases are often linked to extended absences from work,¹¹⁰ 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.

Better health often means being able to work more effectively

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.¹¹¹

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.

FIGURE 11: Economic output in GDP of closing the women's health gap on a global scale



1. Note that \$1 trillion is likely the lower end of the range given data availability issues. 2. Includes impact on older adults (high- and upper-middle-income countries only), informal caregivers (in OECD only) and people with disabilities (global).

Source: University of Washington's Institute for Health Metrics and Evaluation, used with permission; Oxford Economics; ILOSTAT; OECD; Eurostat; National Transfer Accounts project; McKinsey Global Institute analysis

The top 10 conditions alone contribute more than 50% of the economic 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 (Figure 12). 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.¹¹² 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.¹¹³ By

addressing PMS with effective interventions, women could experience less pain, experience better quality of life and feel more able to work.

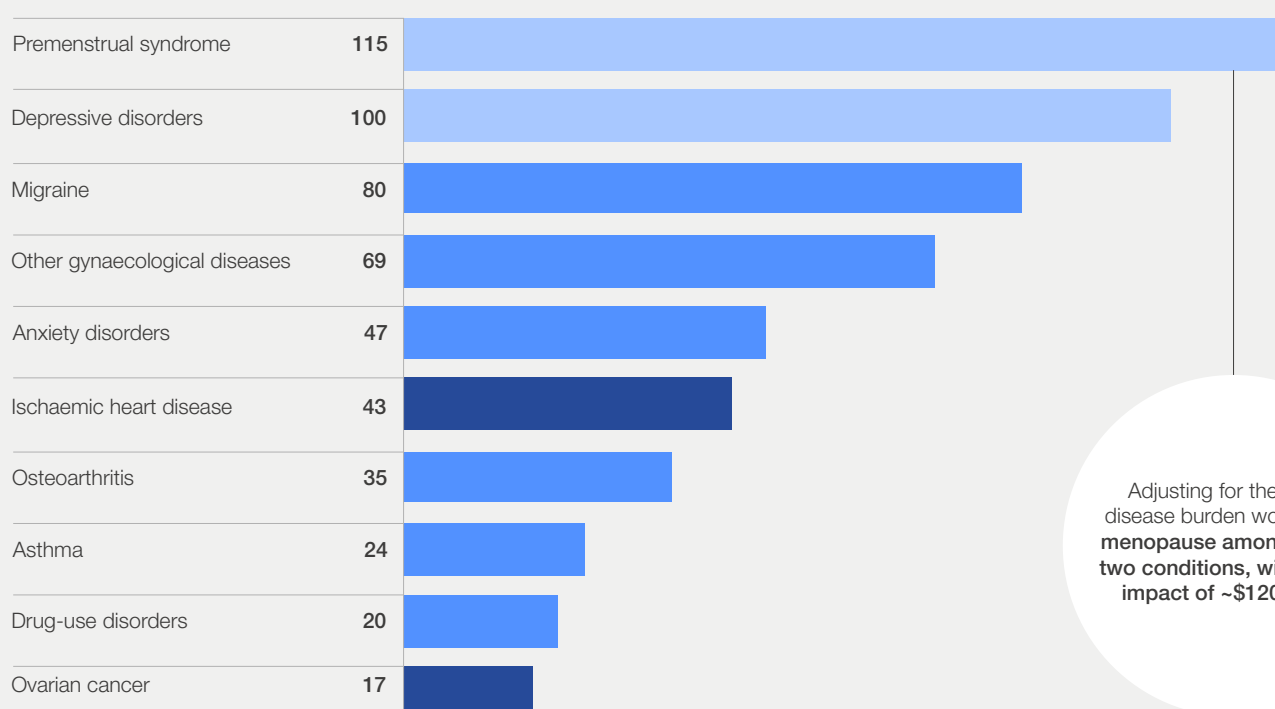
Regional disease burden and healthcare status will lead to conditions having the greatest economic impact in different countries. When examining economic impact, rather than DALY impact, more weight is given to conditions that affect people during years of working age, as that is when economic contribution 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.¹¹⁴

FIGURE 12: Top ten conditions by GDP impact

GDP impact of closing the women's health gap for the top 10 conditions, \$ billions

Channel with the highest contribution to GDP impact: ● Fewer early deaths ● Fewer health conditions ● Increase in productivity



Adjusting for the actual disease burden would place **menopause among the top two conditions, with a GDP impact of ~\$120 billion**

Note: Based on estimate, number of women aged 45–55 (excluding peri- and postmenopausal women), multiplied by the share of symptomatic cases (92%).

Source: Endometriosis prevalence from WHO; prevalence base for GDP impact calculation from IHME GBD (2019)

Generally, a reduction in health conditions is tied to a woman's economic potential, with allowances for regional socioeconomic and healthcare factors (Figure 13). The top two conditions by contribution to GDP impact of the women's health gap are

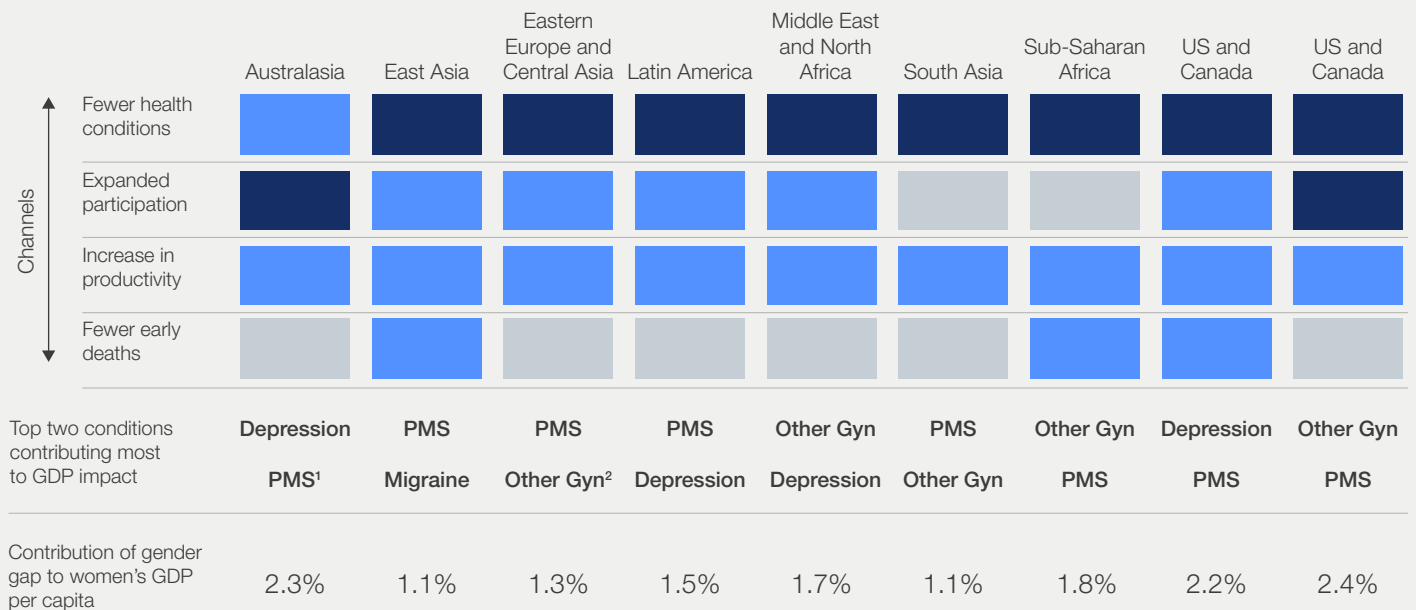
always a combination of two of the top four global conditions (PMS, depression, migraine or other gynaecological conditions). Larger differences among regions are observed when looking at the top 10 or more conditions.

FIGURE 13: GDP impact relative to women's GDP per capita across geographic regions, as well as the top two conditions contributing most to GDP impact by region

Relative share of gender gap GDP impact of women's GDP per capita across different levers and geographies

Relative share of gender gap GDP impact to total women's GDP per capita, %

● High ● Medium ● Low



1. Pre-menstrual syndrome. 2. Other gynaecological conditions

Source: McKinsey analysis

Across the four channels, the highest GDP impact relative to women's GDP is observed in HICs and LICs (Figure 14). For LICs, most of the impact comes from fewer early deaths and fewer health

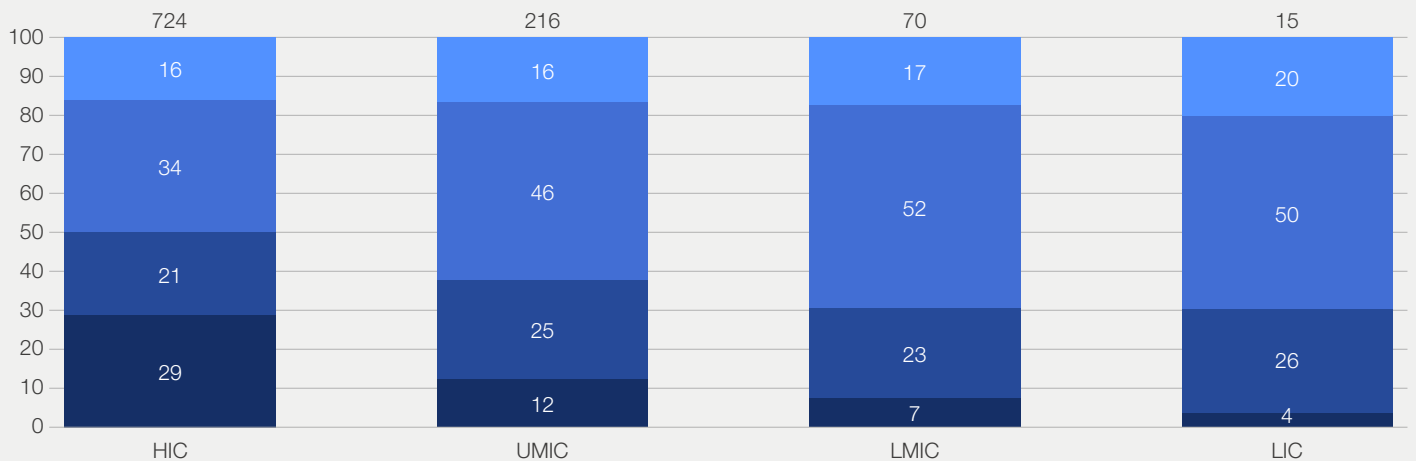
conditions. Both upper-middle income (UMIC) and lower-middle income (LMIC) regions exhibit an overall lower projected GDP impact.

FIGURE 14: Contribution of different channels GDP impact in different income regions

Share of different channels on total women's GDP impact due to closing the gender health gap

Share of GDP impact in %, total GDP impact in \$ billions

● Fewer early deaths ● Fewer health conditions ● Increase in productivity ● Expanded participation



Source: McKinsey analysis

BOX 6: Endometriosis and menopause have a substantial impact on women's ability to work and earning potential

Endometriosis and menopause not only cause women pain and reduce their quality of life but also substantially affect their ability to work and their earning potential. Roughly 80% of affected women state that menopause interferes with their lives, and one-third of these women also experience depression.¹¹⁵ Further, menopause is linked to premature departure from the workforce.¹¹⁶

Similarly, endometriosis is linked to loss in productivity and absenteeism.¹¹⁷ For both conditions, prevalence and disease burden are heavily underestimated. This analysis factors in

the actual economic impact for both conditions. Studies have found up to 90% of women reported menopausal symptoms during the transition.¹¹⁸ This leads to a global prevalence of more than 450 million women and highlights the vast underestimate (versus 35 million in the IHME database). For endometriosis, IHME places the number of cases at 24 million, whereas the WHO puts the prevalence at 190 million.¹¹⁹ Based on these adjusted numbers, improving effectiveness, uptake, access and delivery of care for these conditions alone could give a \$130 billion uplift to the global economy by 2040.

FIGURE 15: Addressing endometriosis and menopause alone could contribute about \$130 billion to global GDP impact by 2040.

Menopause and endometriosis-related GDP impact of closing women's health gap, \$ billions

● Endometriosis ● Menopause



Source: McKinsey analysis

Investing in women's health shows positive return on investment (ROI): for every \$1 invested, ~\$3 is projected in economic growth

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.¹²⁰ 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 health and resilience of their families and communities.

The analyses and findings above 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 (Figure 12). 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.

6

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

To improve health equity and encourage economic growth, stakeholders need to develop a cooperative and comprehensive strategy.



As noted in this report, 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.

Invest in women-centric research to fill the knowledge and data gaps in women-specific conditions, as well as in diseases affecting women differently and/or disproportionately

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.¹²¹ 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.¹²² 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.¹²³

Systematically collect and analyse sex-, ethnicity- and gender-specific data to have more accurate representation of women's health burden and the impact of different interventions

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 2023¹²⁴ 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 credentialing 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.¹²⁵

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.¹²⁶

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.

In addition, two actions to help close the gap are:

Create incentives for new financing models to close the women's health gap

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.¹²⁷

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

As previously outlined, 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. Previous

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.¹²⁹ 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.

Contributors

Lead Authors

Kweilin Ellingrud

Senior Partner, McKinsey & Company; Director, McKinsey Global Institute

Lucy Pérez

Senior Partner, McKinsey & Company; Affiliated Leader, McKinsey Health Institute

Anouk Petersen

Partner, McKinsey & Company

Valentina Sartori

Partner, McKinsey & Company

World Economic Forum

Shyam Bishen

Head, Centre for Health and Healthcare; Member of the Executive Committee

Amira Ghouaibi

Head, Women's Health

Judith Moore

Head, Healthcare Initiatives

Christian Sand Horup

Project Fellow, Women's Health Initiative

We would like to thank Ferring Pharmaceuticals for championing the Coalition for Investing in Women's Health

Anshu Banerjee, WHO; Sarah Barnes, The Woodrow Wilson International Center for Scholars; Jeff Bernson, Mathematica; Sanjana Bhardwaj, Bill & Melinda Gates Foundation; Bineta Diop, Femmes African Solidarité; Samukeliso Dube, Family Planning 2030; Charlotte Ersbøll, Ferring Pharmaceuticals; Anna Frellsen, Maternity Foundation; Katy Geguchadze, Maven Clinic; Patricia Geli, C10 Labs; Mark Hanson, PMNCH; Katja Iversen, Museum for the United Nations; Kristy Kade, White Ribbon Alliance; Keren Leshem, OCON Healthcare; Sofiat Makanjuola-Akinola, Roche Diagnostics Solutions; Divya Mathew, Women Deliver; Kelle Moley, Ferring Pharmaceuticals; Alexandra Plowright, Anglo American; Vivian Riefberg, University of Virginia; Elizabeth Rowley, PATH; Noha Salem, Organon; Stephanie Sassman, Genentech; Nandini Selvam, IQVIA; Dilly Severin, United Nations Foundation; Kathleen Sherwin, Plan International; David Wafford, United Nations Foundation; Michelle Williams, Harvard T.H. Chan School of Public Health; Alice Zheng, RH Capital

Endnotes

- 1 The Women's Health Innovation Opportunity Map is a report from the Innovative Equity Forum, sponsored by the Bill and Melinda Gates Foundation and the National Institutes of Health (NIH): https://orwh.od.nih.gov/sites/orwh/files/docs/womens-health-rnd-opportunity-map_2023_508.pdf.
- 2 The terms "woman" and "man" in this report generally reflect, but are not used exclusively for, sex assigned at birth. The authors acknowledge the importance and need for more research into the challenges facing the transgender, gender-fluid and non-binary communities. The term "woman" in this report includes those under age 18.
- 3 Remme, M. et al., "Investing in the Health of Girls and Women: A Best Buy for Sustainable Development", *British Medical Journal*, 2 June 2020: <https://www.bmj.com/content/369/bmj.m1175>.
- 4 Roser, M., "Twice as Long – Life Expectancy around the World", OurWorldInData, 8 October 2018: <https://ourworldindata.org/life-expectancy-globally>.
- 5 McKinsey Global Institute, "Prioritizing Health: A Prescription for Prosperity", 8 July 2020: <https://www.mckinsey.com/industries/healthcare/our-insights/prioritizing-health-a-prescription-for-prosperity>.
- 6 DALYs for a disease or health condition are the sum of the years of life lost to due to premature mortality (YLLs) and the years lived with a disability (YLDs) due to prevalent cases of the disease or health condition in a population. University of Washington's Institute for Health Metrics and Evaluation, "Global Burden of Disease Study 2019", 2020: <https://www.healthdata.org/research-analysis/gbd>. Used with permission.
- 7 For further details on the method and assumptions used to translate health benefits into economic impact, see the [technical appendix](#).
- 8 Consistent with the National Institutes of Health (NIH); see NIH, "Women's Health": <https://www.nichd.nih.gov/health/topics/womenshealth>.
- 9 University of Washington's Institute for Health Metrics and Evaluation, "Global Burden of Disease Study 2019", 2020: <https://www.healthdata.org/research-analysis/gbd>. Used with permission.
- 10 Centers for Disease Control and Prevention, "Blood Pressure and Pregnancy": <https://www.cdc.gov/bloodpressure/pregnancy.htm>.
- 11 Joslin Diabetes Center, "What is Gestational Diabetes?": <https://www.joslin.org/patient-care/diabetes-education/diabetes-learning-center/what-gestational-diabetes>.
- 12 Measured in disability-adjusted life years (DALYs), comprising years lived with disability (YLD) and years of life lost (YLL).
- 13 Reduction per country, age group, disease, risk factor, year analysed; measured in deaths, years lived with disability (YLD) and years of life lost (YLL).
- 14 University of Washington's Institute for Health Metrics and Evaluation (IHME), Global Burden of Disease dataset, 2019. Used with permission.
- 15 International Labour Organization (ILOSTAT), "ILO Modelled Estimates Database" (accessed 14 February 2022): <https://ilostat ilo.org/data/>.
- 16 Such as probability to return to workforce, wage penalties, time from unemployment to employment, time lag of interventions, time to reach intervention theoretical maximum.
- 17 "Medical knowledge, including diagnostic criteria, is principally based on a male standard. Women patients' symptoms are often labelled 'atypical', suggesting biases in diagnostic criteria." Galea, L. and Parekh, R.S., "Ending the Neglect of Women's Health in Research", *British Medical Journal*, 381, 2023, 1303: <https://pubmed.ncbi.nlm.nih.gov/37308180/>.
- 18 Zucker, I. and Beery, A.K., "Males Still Dominate Animal Studies", *Nature*, June 2010: <https://www.nature.com/articles/465690a>.
- 19 Schulte, K.J. and Mavrovitz, H.N., "Myocardial Infarction Signs and Symptoms: Females vs. Males", *Cureus*, 2023: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10182740/>.
- 20 University of Washington's Institute for Health Metrics and Evaluation, "Global Burden of Disease Study 2019", 2020: <https://www.healthdata.org/research-analysis/gbd>. Used with permission. BMJ Best Practice, "Acute Asthma Exacerbation in Adults", BMJ Publishing Group 2023: <https://bestpractice.bmj.com/topics/en-gb/3000085>.
- 21 Loymans, R.J.B. et al., "Comparative Effectiveness of Long Term Drug Treatment Strategies to Prevent Asthma Exacerbations: Network Meta-analysis", *British Medical Journal*, 348, 2014: <https://pubmed.ncbi.nlm.nih.gov/24919052/>; Wells, K.E. et al., "The Relationship Between Combination Inhaled Corticosteroid and Long-Acting-agonist Use and Severe Asthma Exacerbations in a Diverse Population", *Journal of Allergy and Clinical Immunology*, 129(5), May 2012, 1274–1279: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3340459/>.
- 22 Data for 2019. University of Washington's Institute for Health Metrics and Evaluation, "Global Burden of Disease Study 2019", 2020: <https://www.healthdata.org/research-analysis/gbd>. Used with permission.

- 23 Heer, T. et al., "Sex Differences in Percutaneous Coronary Intervention – Insights from the Coronary Angiography and PCI Registry of the German Society of Cardiology", *Journal of the American Heart Association*, 6(3), 20 March 2017: <https://pubmed.ncbi.nlm.nih.gov/28320749/>.
- 24 World Health Organization, "A Roadmap to Combat Postpartum Haemorrhage between 2023 and 2030", 2023: https://cdn.who.int/media/docs/default-source/reproductive-health/maternal-health/pph-roadmap.pdf?sfvrsn=db36b511_3.
- 25 For adverse events, this was 12.9 million for women vs. 8.5 million for men through to 2022, according to the Food and Drug Administration Adverse Events Reporting System (FAERS). For serious or fatal events, this was 8.3 million for women vs. 6.1 million reports for men.
- 26 Ibid.
- 27 Flaskerud, J.H. and Nyamathi, A.M., "Attaining Gender and Ethnic Diversity in Health Intervention Research: Cultural Responsiveness Versus Resource Provision", *Advances in Nursing Science*, 22(4), June 2000: <https://pubmed.ncbi.nlm.nih.gov/10852665/>; Agénor, M. et al., "Sexual Orientation Identity Disparities in Health Behaviors, Outcomes, and Services Use Among Men and Women in the United States: A Cross-Sectional Study", *BMC Public Health*, 16, August 2016: <https://bmcpubhealth.biomedcentral.com/articles/10.1186/s12889-016-3467-1>.
- 28 University College London, "Analysis: Women's Pain Is Routinely Underestimated, and Gender Stereotypes Are to Blame", 9 April 2021: <https://www.ucl.ac.uk/news/2021/apr/analysis-womens-pain-routinely-underestimated-and-gender-stereotypes-are-blame#:~:text=An%20additional%20experiment%20showed%20that,to%20report%20pain%20than%20men>; Zhang, L. et al., "Gender Biases in Estimation of Others' Pain", *The Journal of Pain*, 22(9), September 2021, 1048–1059: <https://pubmed.ncbi.nlm.nih.gov/33684539/>; Glowacki, D., "Effective Pain Management and Improvements in Patients' Outcomes and Satisfaction", *Critical Care Nurse*, 35(3), June 2015, 33–41: <https://pubmed.ncbi.nlm.nih.gov/26033099/>.
- 29 Developed from: Burns, D. et al., "Closing the Data Gaps in Women's Health", McKinsey, April 2023: <https://digitalrosh.com/wp-content/uploads/2023/04/closing-the-data-gaps-in-womens-health-vf-1.pdf>.
- 30 McKinsey & Company, "Unlocking Opportunities in Women's Healthcare": <https://www.mckinsey.com/industries/healthcare/our-insights/unlocking-opportunities-in-womens-healthcare>.
- 31 Global Health 50:50, "The COVID-19 Sex Disaggregated Data Tracker", May update report, 2021: <https://globalhealth5050.org/wp-content/uploads/May-2021-Data-Tracker-Update.pdf>.
- 32 Manyika, J., Silberg, J. and Presten, B., "What Do We Do About the Biases in AI?", *Harvard Business Review*, October 2019: <https://hbr.org/2019/10/what-do-we-do-about-the-biases-in-ai>; Kusner, M.J. et al., "Counterfactual Fairness", *NeurIPS Proceedings*, 2017: https://papers.nips.cc/paper_files/paper/2017.
- 33 The Faculty of Health and Medical Sciences, University of Copenhagen, "Across Diseases, Women Are Diagnosed Later Than Men", March 2019: <https://www.sciencedaily.com/releases/2019/03/190311103059.htm>.
- 34 Westwood, S. et al., "Disparities in Women with Endometriosis Regarding Access to Care, Diagnosis, Treatment, and Management in the United States: A Scoping Review", *Cureus*, 15(5), May 2023, e38765: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10250135/>; Horne, A.W. and Saunders, P.T., "SnapShot: Endometriosis", *Cell*, 179(7), 12 December 2019, 1677: <https://pubmed.ncbi.nlm.nih.gov/31951524/>.
- 35 World Health Organization, "Endometriosis Factsheet", 2023: <https://www.who.int/news-room/fact-sheets/detail/endometriosis>.
- 36 University of Washington's Institute for Health Metrics and Evaluation, "Global Burden of Disease Study 2019", 2020: <https://www.healthdata.org/research-analysis/gbd>. Used with permission.
- 37 European Society of Human Reproduction and Embryology, "Endometriosis: Guideline of European Society of Human Reproduction and Embryology", 2022: <https://www.eshre.eu/Guidelines-and-Legal/Guidelines/Endometriosis-guideline.aspx>; United Kingdom National Institute for Health and Care Excellence (NICE), "Endometriosis: Diagnosis and Management", NICE Guideline NG73, 2017: <https://www.nice.org.uk/guidance/ng73>.
- 38 Clayton, J.A., "Sex Influences in Neurological Disorders: Case Studies and Perspectives", *Dialogues in Clinical Neuroscience*, 18(4), December 2016: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5286721/>.
- 39 Whiteley, J. et al., "The Impact of Menopausal Symptoms on Quality of Life, Productivity, and Economic Outcomes", *Journal of Women's Health*, 22(11), November 2013, 983–990: <https://pubmed.ncbi.nlm.nih.gov/24083674/>.
- 40 Other gynaecological disorders include menstrual disorders and non-menstrual disorders, including absent, scanty and rare menstruation, pain and other conditions; and inflammatory and non-inflammatory diseases of the breast, ovaries and cervix. University of Washington's Institute for Health Metrics and Evaluation, "Global Burden of Disease Study 2019", 2020: <https://www.healthdata.org/research-analysis/gbd>. Used with permission.
- 41 Dorr, B., "In the Misdiagnosis of Menopause, What Needs to Change?", *American Journal of Managed Care*, 14 September 2022: <https://www.ajmc.com/view/contributor-in-the-misdiagnosis-of-menopause-what-needs-to-change->.
- 42 The Partnership for Maternal, Newborn, and Child Health and UNICEF, *State of the World's Children 2015*: <https://data.unicef.org/resources/state-worlds-children-2015/>; World Health Organization, *Trends in Maternal Mortality 2000 to 2020: Estimates by WHO, UNICEF, UNFPA, World Bank Group and UNDESA/Population Division*, 23 February 2023: <https://www.who.int/publications/i/item/9789240068759>.
- 43 US Food and Drug Administration, "Guideline for the Study and Evaluation of Gender Differences in the Clinical Evaluation of Drugs", Federal Register [58 FR 39406], 1993: <https://pubmed.ncbi.nlm.nih.gov/11645233/>.

- 44 Jenei, K. et al., "The Inclusion of Women in Global Oncology Drug Trials over the Past 20 Years", *JAMA Oncology*, 7(10), 2021, 1569–1570: <https://jamanetwork.com/journals/jamaoncology/fullarticle/2783533>.
- 45 Perera, N.D. et al., "Analysis of Female Participant Representation in Registered Oncology Clinical Trials in the United States from 2008 to 2020", *The Oncologist*, 2023: <https://pubmed.ncbi.nlm.nih.gov/36848266/>.
- 46 Vassallo, A. et al., "Sex and Gender in COVID-19 Vaccine Research: Substantial Evidence Gaps Remain", *Frontiers in Global Women's Health*, 2, 2021: <https://www.frontiersin.org/articles/10.3389/fgwh.2021.761511/full>.
- 47 *The Lancet*, "Sex-Disaggregated Data in COVID-19 Vaccine Trials", March 2021: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7952097/>.
- 48 Vassallo, A. et al., "Sex and Gender in COVID-19 Vaccine Research: Substantial Evidence Gaps Remain", *Frontiers in Global Women's Health*, 2, 2021, 761511.: <https://www.frontiersin.org/articles/10.3389/fgwh.2021.761511/full>.
- 49 Waldhorn, I. et al., "Trends in Women's Leadership of Oncology Clinical Trials", *Frontiers in Oncology*, 12, 8 June 2022: <https://www.frontiersin.org/journals/oncology/articles/10.3389/fonc.2022.885275/full>.
- 50 L'Abbé, K.A., Detsky, A.S. and O'Rourke, K., "Meta-analysis in Clinical Research", *Annals of Internal Medicine*, 107(2), August 1987, 224–233: <https://pubmed.ncbi.nlm.nih.gov/3300460/>.
- 51 Waldhorn, I. et al., "Trends in Women's Leadership of Oncology Clinical Trials", *Frontiers in Oncology*, 12, 8 June 2022: <https://www.frontiersin.org/journals/oncology/articles/10.3389/fonc.2022.885275/full>.
- 52 More detailed discussion available in: Burns, D. et al., "Closing the Data Gaps in Women's Health", McKinsey & Company, April 2023: <https://digitalrosh.com/wp-content/uploads/2023/04/closing-the-data-gaps-in-womens-health-vf-1.pdf>.
- 53 Bertakis, K.D. et al., "Gender Differences in the Utilization of Health Care Services", *Journal of Family Practice*, 49(2), February 2000, 147–152: <https://pubmed.ncbi.nlm.nih.gov/10718692/>; McKinsey & Company, "Women in the Healthcare Industry", 7 June 2019: <https://www.mckinsey.com/industries/healthcare/our-insights/women-in-the-healthcare-industry>; European Institute for Gender Equality (EIGE), "Gender Mainstreaming in Health", January 2017: https://eige.europa.eu/gender-mainstreaming/policy-areas/health?language_content_entity=en.
- 54 Wang, Y. et al., "Do Men Consult Less Than Women? An Analysis of Routinely Collected UK General Practice Data", *British Medical Journal Open* 2013: <https://bmjopen.bmj.com/content/bmjopen/3/8/e003320.full.pdf>.
- 55 Paulsen, E., "Recognizing, Addressing Unintended Gender Bias in Patient Care", *Duke Health Practice Management*, 2020: <https://physicians.dukehealth.org/articles/recognizing-addressing-unintended-gender-bias-patient-care>.
- 56 Khan, M.M., "Menstrual Health and Hygiene: What Role Can Schools Play?", *World Bank Blogs*, 27 May 2022: <https://blogs.worldbank.org/education/menstrual-health-and-hygiene-what-role-can-schools-play>.
- 57 Ní Chéileachair, F., McGuire, B.E. and Durand, H., "Coping with Dysmenorrhea: A Qualitative Analysis of Period Pain Management Among Students Who Menstruate", *BMC Womens Health*, 22(1), 5 October 2022, 407: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9533282/>; Jabeen, A. et al., "Polycystic Ovarian Syndrome: Prevalence, Predisposing Factors, and Awareness Among Adolescent and Young Girls of South India", *Cureus*, 14(8), 12 August 2022: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9464521/>; Chandler, D. et al., "'I Think People Should Be More Aware': Uterine Fibroid Experiences Among Women Living in Indiana, USA", *Patient Education and Counseling*, 107, 2023: <https://www.sciencedirect.com/science/article/abs/pii/S07383399122008679>.
- 58 Yang, Y.T. and Chen, D.R., "Effectiveness of a Menstrual Health Education Program on Psychological Well-Being and Behavioral Change Among Adolescent Girls in Rural Uganda", *Journal of Public Health in Africa*, 14(3), 18 April 2023: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10184177/>; Kansiime, C. et al., "Menstrual Health Intervention and School Attendance in Uganda (MENISCUS-2): A Pilot Intervention Study", *British Medical Journal Open* 2020: <https://ichgcp.net/clinical-trials-registry/publications/163131-menstrual-health-intervention-and-school-attendance-in-uganda-meniscus-2-a-pilot-intervention-study>; Khalilzadeh, P. et al., "Evaluating the Effect of Educational Intervention Based on the Health Belief Model on the Lifestyle Related to Premenstrual Syndrome and Reduction of Its Symptoms Among the First-Grade High School Girls", *BMC Public Health*, 2023: <https://bmcpublihealth.biomedcentral.com/articles/10.1186/s12889-023-15950-y>.
- 59 Lei, J. et al., "HPV Vaccination and the Risk of Invasive Cervical Cancer", *New England Journal of Medicine*, October 2020: <https://www.nejm.org/doi/full/10.1056/NEJMoa1917338>.
- 60 World Health Organization, *Global Strategy to Accelerate the Elimination of Cervical Cancer as a Public Health Problem*: <https://iris.who.int/bitstream/handle/10665/336583/9789240014107-eng.pdf?sequence=1>.
- 61 Bruni, L., et al., "Cervical Cancer Screening Programmes and Age-Specific Coverage Estimates for 202 Countries and Territories Worldwide: A Review and Synthetic Analysis", *Lancet Global Health*, 10(8), August 2022: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9296658/>. (Erratum in: *Lancet Global Health* 11(7), July 2023.); in this report, the analysis began with the projected baseline disease burden by sex, age group, year and country, for 195 countries. For more on the methodology, visit the [technical appendix](#).
- 62 Moneyland, "Financial Inequalities Between Women and Men in Switzerland", 2023: <https://www.moneyland.ch/en/women-men-financial-inequalities-switzerland>.
- 63 Future Generali, "How Health Insurance Premium Varies by Gender?", 2022: <https://life.futuregenerali.in/life-insurance-made-simple/life-insurance/how-health-insurance-premium-varies-by-gender>.
- 64 World Bank, "Menstrual Health and Hygiene": <https://www.worldbank.org/en/topic/water/brief/menstrual-health-and-hygiene>.

- 65 Tull, K., "Period Poverty Impact on the Economic Empowerment of Women", 2019: <https://www.unicef.org/bangladesh/en/stories/school-girls-bangladesh-learn-periods-are-nothing-be-ashamed>.
- 66 Ibid.
- 67 European Parliamentary Forum for Sexual and Reproductive Rights, "Launch of the Global Contraception Policy Atlas at Women Deliver 2023": <https://www.epfweb.org/node/1002>.
- 68 Boden, J.M., Fergusson, D.M. and Horwood, L.J., "Outcomes for Children and Families Following Unplanned Pregnancy: Findings from a Longitudinal Birth Cohort", *Child Indicators Research*, 8, 2014, 389–402: <https://link.springer.com/article/10.1007/s12187-014-9241-y>.
- 69 Department of Health and Social Care, "Women's Health Hubs: Cost-Benefit Analysis", July 2023: <https://www.gov.uk/government/publications/womens-health-hubs-information-and-guidance/womens-health-hubs-cost-benefit-analysis>.
- 70 Nabel, E.G., "Coronary Heart Disease in Women – an Ounce of Prevention", *New England Journal of Medicine*, 343, 2000, 572–574; Harvard Health Blog, "Women and Pain: Disparities in Experience and Treatment", 9 October 2017: <https://www.health.harvard.edu/blog/women-and-pain-disparities-in-experience-and-treatment-2017100912562>.
- 71 Ola, O. et al., "Clinical Impact of High-Sensitivity Cardiac Troponin T Implementation in the Community", *Journal of the American College of Cardiology*, 77(25), 2021, 3160–3170: <https://pubmed.ncbi.nlm.nih.gov/34167641/>; Region Skåne: "Riktlinjer för användning av Siemens högkänsliga troponin I vid handläggning av patienter med bröstsmärta" [in Swedish]: <https://docplayer.se/193548990-Riktlinjer-for-anvandning-av-siemens-hogkansliga-troponin-i-vid-handlaggning-av-patienter-med-brostsmarta.html>.
- 72 Zumla, A., Bates, M. and Mwaba, P., "The Neglected Global Burden of Tuberculosis in Pregnancy", *The Lancet Global Health*, 2(12), 2014, e675–6: [https://www.thelancet.com/journals/langlo/article/PIIS2214-109X\(14\)70338-9/fulltext](https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(14)70338-9/fulltext).
- 73 Ali, R.F. et al., "Integrating Tuberculosis Screening into Antenatal Visits to Improve Tuberculosis Diagnosis and Care: Results from a Pilot Project in Pakistan", *International Journal of Infectious Diseases*, 108, 2021, 391–396: <https://pubmed.ncbi.nlm.nih.gov/34087487/>.
- 74 European Society of Cardiology, "Women More Likely to Die After Heart Attack Than Men", 22 May 2023: <https://www.escardio.org/The-ESC/Press-Office/Press-releases/Women-more-likely-to-die-after-heart-attack-than-men>.
- 75 Huded, C.P. et al., "4-Step Protocol for Disparities in STEMI Care and Outcomes in Women", *Journal of the American College of Cardiology*, 71(19), 2018, 2122–2132: <https://pubmed.ncbi.nlm.nih.gov/29535061/>.
- 76 Rismati, H. et al., "The Role of Discharge Checklist in Guideline-Directed Medical Therapy for Heart Failure Patients", *The Korean Journal of Internal Medicine*, 38(2), 2023, 195–206: <https://pubmed.ncbi.nlm.nih.gov/36800678/>.
- 77 UNICEF, "Uterine Balloon Tamponade": <https://www.unicef.org/innovation/uterine-balloon-tamponade>.
- 78 Kennedy-Moulton, K., "Maternal and Infant Health Inequality: New Evidence from Linked Administrative Data", NBER Working Paper 30093, 2022: <https://www.nber.org/papers/w30693>.
- 79 Saroha, E., Altarac, M. and Sibley, L.M., "Caste and Maternal Health Care Service Use Among Rural Hindu Women in Maitha, Uttar Pradesh, India", *Journal of Midwifery & Women's Health*, 53, 2008, e41–e47: <https://pubmed.ncbi.nlm.nih.gov/18761290>.
- 80 Jardine, J. et al., "Risk of Postpartum Haemorrhage Is Associated with Ethnicity: A Cohort Study of 981,801 Births in England", *BJOG: An International Journal of Obstetrics and Gynaecology*, 9 December 2021: <https://obgyn.onlinelibrary.wiley.com/doi/10.1111/1471-0528.17051>.
- 81 Pan American Health Organization, "Maternal Health": <https://www.paho.org/en/topics/maternal-health>; World Health Organization, UNICEF, United Nations Population Fund, The World Bank. "Trends in Maternal Mortality: 2000 to 2017". Geneva, CH: WHO; 2019: <https://www.unfpa.org/featured-publication/trends-maternal-mortality-2000-2017#:~:text=The%20data%20in%20this%20report,an%20estimated%20451%2C000%20maternal%20deaths>.
- 82 Stop TB Partnership, "Gender and TB: A Stop TB Partnership Paper", 2021: <https://www.stoptb.org/gender-and-tb-stop-tb-partnership-paper>.
- 83 Stop TB Partnership, "Gender and TB Investment Package: Community, Rights and Gender", 2020: <https://stoptb.org/assets/documents/communities/TB%20Gender%20Investment%20Package.pdf>.
- 84 KFF, "What is CMMI?" and 11 Other FAQs About the CMS Innovation Center", Washington, DC, 2018: <https://www.kff.org/medicare/fact-sheet/what-is-cmmi-and-11-other-faqs-about-the-cms-innovation-center/>.
- 85 US Department of Health and Human Services, "Medicare Shared Savings Program Saves Medicare More Than \$1.8 Billion in 2022, Continues to Deliver High-Quality Care", 24 August 2023: <https://www.hhs.gov/about/news/2023/08/24/medicare-shared-savings-program-saves-medicare-more-1-8-billion-2022-continues-deliver-high-quality-care.html>; Lewis, C. et al., "The Impact of the Payment and Delivery System Reforms of the Affordable Care Act", *The Commonwealth Fund*, 28 April 2022: <https://www.commonwealthfund.org/publications/2022/apr/impact-payment-and-delivery-system-reforms-affordable-care-act>.
- 86 Cossio-Gil, Y. et al., "The Roadmap for Implementing Value-Based Healthcare in European University Hospitals – Consensus Report and Recommendations", *Value in Health*, 25(7), 2022, 1148–1156: [https://www.valueinhealthjournal.com/article/S1098-3015\(21\)03180-6/fulltext](https://www.valueinhealthjournal.com/article/S1098-3015(21)03180-6/fulltext).
- 87 Congressional Research Service, "US Research and Development Funding and Performance: Fact Sheet", 2022: <https://sgp.fas.org/crs/misc/R44307.pdf>; Boroush, M. and Guci, L., "Research and Development: US Trends and International Comparisons", *Science and Engineering Indicators* 2022, 28 April 2022: <https://nces.nsf.gov/pubs/nsb20225>.

- 88 Cleary, E., Jackson, M.J. and Ledley, F., "Government as the First Investor in Biopharmaceutical Innovation: Evidence from New Drug Approvals 2010–2019", Institute for New Economic Thinking Working Paper Series No. 133, 18 November 2020: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3731819; Cleary, E.G. et al., "Contribution of NIH Funding to New Drug Approvals 2010-2016", *Proceedings of the National Academy of Sciences of the United States of America*, 115(10), 2018, 2329–2334: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5878010/>.
- 89 Women Health Access Matters, "Perspectives on Advancing NIH Research to Inform and Improve the Health of Women", 2021: <https://orwh.od.nih.gov/sites/orwh/files/docs/ORWH-WHC-Report-508C.pdf>.
- 90 Smith, K., "Women's Health Research Lacks Funding – These Charts Show How", *Nature*, 3 May 2023: <https://www.nature.com/immersive/d41586-023-01475-2/index.html>.
- 91 ResearchGate, "Why Do We Still Not Know What Causes PMS?", 2016: <https://www.researchgate.net/blog/why-do-we-still-not-know-what-causes-pms>.
- 92 Dmitrovic, R., Kunselman, A.R. and Legro, R.S., "Sildenafil Citrate in the Treatment of Pain in Primary Dysmenorrhea: A Randomized Controlled Trial", *Human Reproduction*, 28(11), November 2013, 2958–2965: <https://academic.oup.com/humrep/article/28/11/2958/628626>; CBC, "There's a Gender Gap in Medical Data, and It's Costing Women Their Lives, Says This Author", CBC, 17 August 2019: <https://www.cbc.ca/radio/thecurrent/the-current-for-march-11-2019-1.5049277/there-s-a-gender-gap-in-medical-data-and-it-s-costing-women-their-lives-says-this-author-1.5049286>.
- 93 Women Health Access Matters, "WHAM Launches #3not30 Campaign to Call for Doubling the Funding for Women's Health Research in the Next Three Years", WHAM, 19 January 2023: <https://whamnow.org/news/wham-launches-3not30-campaign-to-call-for-doubling-the-funding-for-womens-health-research-in-the-next-three-years/>.
- 94 Lou, Z. et al., "Global, Regional, and National Time Trends in Incidence, Prevalence, Years Lived with Disability for Uterine Fibroids, 1990–2019: An Age-Period-Cohort Analysis for the Global Burden of Disease 2019 Study", *BMC Public Health*, 23(916), 2023: <https://doi.org/10.1186/s12889-023-15765-x>.
- 95 Ayta, I.A., McKinlay, J.B. and Krane, R.J., "The Likely Worldwide Increase in Erectile Dysfunction Between 1995 and 2025 and Some Possible Policy Consequences", *BJU International*, 1999: <https://pubmed.ncbi.nlm.nih.gov/10444124/>; Lovelace, B., Jr., "Pfizer Still Holds the Lead in the Erectile Dysfunction Market Even as Viagra Sales Falter", *CNBC Health and Science*, 14 February 2019: <https://www.cnn.com/2019/02/13/pfizer-holds-lead-in-erectile-dysfunction-market-as-viagra-sales-fall.html>.
- 96 Pharmaceutical Technology, "Viagra Outdoes Competition with Q3 Sales", 18 December 2020: <https://www.pharmaceutical-technology.com/analyst-comment/viagra-competition-q3-sales/>.
- 97 World Health Organization, "Endometriosis", 24 March 2023: <https://www.who.int/news-room/fact-sheets/detail/endometriosis>.
- 98 Estimate based on global population of women between ages 45 and 55 and more than 90% of women experiencing at least one symptom during the menopausal transition.
- 99 Mangum, A. "The \$600 Billion Market for Women in Menopause Is Fit for Disruption", 28 March 2021, Bloomberg: <https://www.bloomberg.com/news/articles/2021-03-28/womaness-menopause-beauty-products-line-to-be-sold-at-target-tgt-stores>.
- 100 Evaluate Pharma database, accessed 2023.
- 101 Al-Sukhun, S. et al., "Breast Cancer Priorities in Limited-Resource Environments: The Price-Efficacy Dilemma in Cancer Care", *American Society of Clinical Oncology Educational Book*, 42, 2022: https://ascopubs.org/doi/full/10.1200/EDBK_349861.
- 102 Kembler, E. et al., "The Dawn of the FemTech Revolution", McKinsey, 14 February 2022: <https://www.mckinsey.com/industries/healthcare/our-insights/the-dawn-of-the-femtech-revolution>.
- 103 Ibid.
- 104 Ibid.
- 105 Argyres, D. et al., "Digital Health: An Opportunity to Advance Health Equity", McKinsey & Company, 26 July 2022: <https://www.mckinsey.com/industries/life-sciences/our-insights/digital-health-an-opportunity-to-advance-health-equity>.
- 106 EIT Health Ireland-UK, "FemTech Revolution: Which Start-Ups Are Transforming Women's Health", 8 March 2023: <https://eithealth.eu/news-article/femtech-revolution-which-start-ups-are-transforming-womens-health/>.
- 107 Ortiz-Ospina, E., Tzvetkova, S. and Roser, M., "Women's Employment", OurWorldInData.org, 2018: <https://ourworldindata.org/female-labor-supply>.
- 108 Weinstein, A., "When More Women Join the Workforce, Wages Rise – Including for Men", *Harvard Business Review*, 31 January 2018: <https://hbr.org/2018/01/when-more-women-join-the-workforce-wages-rise-including-for-men#:~:text=Across%20various%20model%20specifications%2C%20,the%20Journal%20of%20Regional%20Science>.
- 109 Gallup, "Towards a Better Future for Women and Work: Voices of Women and Men", 2016: https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_546256.pdf.
- 110 Hemp, P., "Presenteeism: At Work – But Out of It", *Harvard Business Review*, October 2004: <https://hbr.org/2004/10/presenteeism-at-work-but-out-of-it>.
- 111 International Bank for Reconstruction and Development/The World Bank, "Global Economic Prospects", June 2023: <https://openknowledge.worldbank.org/server/api/core/bitstreams/6e892b75-2594-4901-a036-46d0dec1e753/content>.

- 112 Arab, A. et al., "Beneficial Role of Calcium in Premenstrual Syndrome: A Systematic Review of Current Literature", *International Journal of Preventive Medicine*, 11, 22 September 2020: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7716601/>.
- 113 Babapour, F. et al., "The Effect of Peer Education Compared to Education Provided by Healthcare Providers on Premenstrual Syndrome in High School Students: A Social Network-Based Quasi-Experimental Controlled Trial", *Neuropsychopharmacology Reports*, March 2023: <https://pubmed.ncbi.nlm.nih.gov/36411265/>.
- 114 Cedars-Sinai, "How Infertility Impacts Mental Health", Cedars-Sinai Blog, 8 September 2020: <https://www.cedars-sinai.org/blog/infertility-mental-health.html>.
- 115 Burns, D. et al., "Closing the Data Gaps in Women's Health", McKinsey & Company, April 2023: <https://digitalrosh.com/wp-content/uploads/2023/04/closing-the-data-gaps-in-womens-health-vf-1.pdf>.
- 116 Burden, L., "Women Are Leaving the Workforce for a Little-Talked-About Reason", Bloomberg, 18 June 2021: <https://www.bloomberg.com/news/articles/2021-06-18/women-are-leaving-the-workforce-for-a-little-talked-about-reason>; D'Angelo, S. et al., "Impact of Menopausal Symptoms on Work: Findings from Women in the Health and Employment after Fifty (HEAF) Study", *International Journal of Environmental Research and Public Health*, 20(1), 24 December 2022, 295: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9819903/>.
- 117 Nnoaham, K.E. et al., "Impact of Endometriosis on Quality of Life and Work Productivity: A Multicenter Study across Ten Countries", *Fertility and Sterility*, 96(2), August 2011, 366–373: <https://pubmed.ncbi.nlm.nih.gov/21718982/>.
- 118 Constantine, G.D. et al., "Behaviours and Attitudes Influencing Treatment Decisions for Menopausal Symptoms in Five European Countries", *Post Reproductive Health*, 2016: <https://pubmed.ncbi.nlm.nih.gov/26895640/>.
- 119 World Health Organization (WHO), "Endometriosis": <https://www.who.int/news-room/fact-sheets/detail/endometriosis>.
- 120 In order to identify the incremental or net steady-state cost of each intervention, analysts identified the cost per DALY averted from the scientific literature (primarily WHO, DCP-3 and the Tufts Cost-Effectiveness Analysis Registry) for each intervention and income archetype and converted to standardized US dollars. To calculate the total cost for each country, the unit cost (cost per DALY averted) was multiplied by the volume of DALYs averted by that particular intervention in 2040. Further discussion of the strengths and limitations of this approach are provided in the [technical appendix](#).
- 121 World Health Organization, "10 Key Issues in Ensuring Gender Equity in the Global Health Workforce": <https://www.who.int/news-room/feature-stories/detail/10-key-issues-in-ensuring-gender-equity-in-the-global-health-workforce>.
- 122 Asuako, J., "Women's Participation in Decision Making: Why It Matters", UNDP, 4 December 2020: <https://www.undp.org/ghana/news/women%E2%80%99s-participation-decision-making-why-it-matters>.
- 123 Koning, R., Samila, S. and Ferguson, J.-P., "Who Do We Invent For? Patents by Women Focus More on Women's Health, but Few Women Get to Invent", *Science*, 372 (6548), 18 June 2021, 1345–1348: <https://pubmed.ncbi.nlm.nih.gov/34140388/>.
- 124 NIH Office of Research on Women's Health, "Women's Health Research and Development Opportunity Map", 2023: https://orwh.od.nih.gov/sites/orwh/files/docs/womens-health-rnd-opportunity-map_2023_508.pdf.
- 125 Ibid.
- 126 Lloyd, C.Ö. and Horup, C. S., "Leaders in Women's Health Call for More Investment in Midwives to Prevent 4.3 Million Deaths Each Year", World Economic Forum, 5 May 2023: <https://www.weforum.org/agenda/2023/05/international-day-of-the-midwife-call-for-more-investment>.
- 127 NIH Office of Research on Women's Health, "Women's Health Research and Development Opportunity Map", 2023: https://orwh.od.nih.gov/sites/orwh/files/docs/womens-health-rnd-opportunity-map_2023_508.pdf.
- 128 Mental Health America, "Depression in Women": <https://mhanational.org/depression-women>.
- 129 McKinsey & Company, "Women in the Workplace 2023": <https://www.mckinsey.com/featured-insights/diversity-and-inclusion/women-in-the-workplace>.



COMMITTED TO
IMPROVING THE STATE
OF THE WORLD

The World Economic Forum, committed to improving the state of the world, is the International Organization for Public-Private Cooperation.

The Forum engages the foremost political, business and other leaders of society to shape global, regional and industry agendas.

World Economic Forum
91–93 route de la Capite
CH-1223 Cologny/Geneva
Switzerland

Tel.: +41 (0) 22 869 1212
Fax: +41 (0) 22 786 2744
contact@weforum.org
www.weforum.org