RISK strategies CONSULTING

WHITE PAPER

Women's Health Challenges, Conditions, and Care Approaches

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Introduction

Why is differentiating health care for women important? After all, all humans have health journeys, challenges, and conditions they are managing. Most of us have a woman in our lives who is important to us; therefore, Risk Strategies Consulting believes we all benefit from learning more about the unique trials women face with respect to receiving well-coordinated and impactful health care that addresses and synchronizes physical and behavioral needs, and we elaborate on these concerns in this paper to bring greater attention to, and awareness of, the issues. A key objective is to mobilize those of us in the health care sector to think differently about women's health needs across their lifetimes, why they may be different than others, and to contemplate and create personalized, yet comprehensive, approaches to improve the experience and outcomes for women across the continuum of care. The objective is not to say that others do not experience health conditions in unique ways, that conditions discussed here are not impacting others, or that women are the only groups needing a renewed lens. However, highlighting the predominant conditions that affect women, how women may experience them differently, why women may be more predisposed to certain conditions, and how numerous societal and medical factors, especially when in concert with others, can propel women's health in a detrimental direction is a critical reminder for all.

The reader may ask: If women are facing health challenges, then why do eight out of 10 delay seeking care until the symptoms become unbearable or significantly interfere with their daily lives?[1] In fact, research shows that 80 percent of women worldwide are aware of self-care but only one percent are willing to change a schedule or spending pattern to nurture self-care[2]. A multitude of reasons are imaginable and valid, but especially this one: lack of time. Other top reasons include having a negative experience with previous medical appointments, cost of health care, financial spending power/dependency, not having a support system, disempowerment, and access to care.[1,2] Let us now explore women's health from a broad lens across their lifetimes, perusing and differentiating top conditions and issues, albeit not exhaustively.

Women in the Workplace

Why, specifically, should an employer or plan sponsor be concerned with the health of women in their work force? These statistics make the answer strikingly clear from several perspectives.[3]

- In 2019, 57% of all women participated in the labor force.
- From 1970 to 2019, the proportion of women ages 25 to 64 in the labor force, who held a college degree quadrupled from 11% to 45%; only five percent had less than a high school diploma, which is much less than the 34% of 1970.
- The labor force participation rate for women with children under 18 years of age was 72% in 2019.
- As of 2019, women's earnings as a proportion of men's earnings have grown over time, from 62% in 1979 to 82%.
- In 2019, 4.1 million women had more than one job.
- Of all women who worked to some degree within the calendar year 2018, 64% worked full-time and year-round compared with 41% in 1970.
- Among those who were in the labor force for at least 27 weeks in 2018, 3.9 million of them were women classified as working poor, a rate higher for women than men by 1.6%.

> As anyone can deduce, women are a major constituent of the employee population, and the status of their health ripples beyond them and their families; job performance, employee satisfaction, productivity, and operating expense are substantial impacts for plan sponsors as well.

We could take any one bullet from the prior page and select that bullet as the focal point for an entire paper; for this publication, however, we are assembling these into themes applicable to women's health, why their health is different, and how we need to think about tackling these issues head on. More than half of all women are in the work force, mostly full-time, and some with two jobs; they are more educated; they work even more after having children; their growing presence in the workplace is being recognized with higher salaries for many, although they still represent the working poor. Women are a major constituent of the employee population, and the status of their health ripples beyond them and their families; job performance, employee satisfaction, productivity, and operating expense are substantial impacts for plan sponsors as well. In fact, consider these figures:[1]

- About 43% of women have recently missed a day or more of work due to health issues.
- Employed women face as much as $15 billion more each year in out-of-pocket costs compared to men.
- Across all ages from 19 to 64, women's out-of-pocket health expenses were higher on average but maternal care only accounted for a portion of these.
- When excluding maternity claims, women experience 10% more in total health expenditures relative to men.
- Top issues impacting women's work productivity causing missed workdays include headache/migraines, infection, behavioral health, physical pain, or digestive issues.

Plan sponsors simply cannot ignore these truths. Women are busier than ever and committed to their education, work, and families. Contrary to common sentiment, humans cannot have it all – at least not at once; only 24 hours are in a day. So, something has to go, and until the wheel is squeakier (that is, symptoms are unbearable), that may translate into preventive medicine and needed medical examinations being placed on hold, especially if compounded with a previously unpleasant encounter or costs that seem too high. This omission, unfortunately, can lead to delayed or missed diagnoses, resulting in far worse outcomes than if they had been addressed on a timelier basis.

Speaking of women in the workforce without including those who do not work outside the home would be an oversight, as these women also have "work" and a distinct set of challenges for access to self and health care. In addition to picking up additional home responsibilities and being the "point person" for various home maintenance and projects because they are on the home front more often, they may also have children, elders, and other family members for whom they provide regular care. These obligations do not easily allow for self-care, needed appointments, quiet time to recharge, or needed adult social interaction with their social support systems. Furthermore, because they "do not work," they are frequently targeted by organizations for extensive volunteering and coordination of school, community, or faith-based events. Certainly, these may be enjoyable or passion-led activities but overcommitment, stress, and burnout ensue for anyone when not kept in check.

Staying at home to care for children with special needs, whether those are physical disabilities, learning delays, emotional challenges, or development disorders, require gaining a special strength in fulfilling caregiving responsibilities because the time and energy can monumentally impact careers, marriages, and other family relationships.[4] Because caring for someone else does not afford respite time, being intentional about scheduling time for self-management and health care, including stress reduction, is critical to avoid jeopardizing themselves *and* their loved ones. The alternative can be emotional burnout including feelings of helplessness, hopelessness, paralysis, and even guilt. Remembering that all will benefit when the caregiver is also nurtured with much needed time and support is essential.

Related to caregiver stress and juggling multiple responsibilities, an important takeaway for all plan sponsors and support networks for workplace or work at home parents is the topic of childcare availability. Sometimes, the choice between working at a place of employment or not boils down to the affordability of quality childcare. If the cost or convenience of childcare outweighs the paycheck, then tough decisions are evident. With many working families, either choice leaves them with little resources for housing, food, utilities, clothing, health care, and other basic needs, causing stress, which can at times escalate into domestic unrest. Investigating quality, affordable childcare is a job in and of itself, where references, certifications, and state records need to be investigated. Daily tasks such as pick up and drop off, managing childcare days closed, and the need to keep supplies for the children replenished all require a great deal of coordination by parents. Some can rely on extended family but those without dependable family support are especially stretched. This calls for plan sponsors to consider childcare within their benefit portfolio to support working parents to allow them to focus on their work minus the worry about their children being well-attended. This may be in the form of onsite childcare to flexible spending accounts or other stipends, and certain flexibilities in working hours. On the other end of the spectrum, having certain of these benefits for those caring for the elderly would be a transformative and appreciated benefit as well.

Gynecological Health

This section explains the basics of women's health, which are based on the reproductive cycle that begins with menstruation and continues through menopause, just in case the reader needs a quick reminder of female biology.[3] During puberty, menstruation begins with an egg being released from the ovary during monthly ovulation. The egg travels down the fallopian tube, where fertilization by sperm may occur. When fertilized, the egg implants into the uterine lining, and pregnancy begins. If not, then the egg and lining are shed during menstruation, which continues until perimenopause, the time of transition to menopause.

Different life stages may bring specific symptoms such as menstrual cramps, mood swings, hot flashes, night sweats, weight gain, sexual changes, and others.[5] As with many health conditions, making healthy lifestyle choices can help symptoms such as these subside. In addition to making these choices, medications can also be prescribed such as for birth control and hormonal therapy.

Importantly, scientists have observed important sex differences across key pathways and processes such as how the body fights disease, processes pain, and maintains heart health, influencing vulnerability to disease, experience of symptoms, and response to treatment.[6] However, shockingly, only in recent decades has clinical research been conducted with female participants; prior to this, the vast majority of all participants were males. This does not just apply to clinical research – even preclinical animal research included male cells or animals, with the assumption that results would apply to all humans. This, un-shockingly, created quite a gap in medical knowledge with respect to women's experience of illness, resulting in delayed or misdiagnosis, and the development of pharmaceuticals with either lower efficacy or greater toxicity to females. Only since 2016 has the National Institutes of Health (NIH) Policy on Sex as a Biological Variable helped ensure NIH-funded research rigorously address sex as a factor in health and disease.

Fertility

For those who want to grow their families, almost nothing causes more angst for women and their families than having difficulties conceiving and carrying a full-term pregnancy. When the above-described normal path to pregnancy does not occur after repeated attempts (six to 12 months, depending on the women's age), then fertility consultation may be a reasonable and desired next step.[7]

At birth, females have all the eggs they will ever have, which is about one million.[8] By puberty, the count is about 500,000, and for each month following, up to 1,000 eggs are lost, and only one of those is matured and ovulated. A young, healthy woman, who is trying to become pregnant has about a 25% chance each month; therefore, women under 35 years old are generally advised to wait a year before seeking fertility consultation. After 35 years old, six months is a reasonable time frame. Interestingly, fertility decline, and the rate of decline increase as women age, which means by age 40, a woman's natural pregnancy chances drop to less than five percent. In addition to age itself, this is also due to diminished egg quality over time, with exposure to elements such as from illness, toxins, and free radicals that can damage egg DNA making the likelihood of genetic disorders for the baby higher with the mother's age. This may encourage some women to freeze their eggs when they are younger to be used later when they are ready for motherhood. Successful fertility is also affected by the woman's age; for example, women 30 years old and younger have a 73% chance of becoming pregnant through artificial insemination with donor sperm versus a 54% chance if over 35. Similarly, for women using their own eggs for in vitro fertilization, their birth rates decline about 10% every two years.

In addition to age, numerous medical issues may contribute to female fertility problems such as these.[7]

- Ovulation disorders such as polycystic ovary syndrome, hyperprolactinemia, and thyroid problems
- Uterine or cervical abnormalities such as polyps or fibroids
- Fallopian tube damage or blockage, often caused by pelvic inflammatory disease
- Endometriosis, which occurs when tissue that normally lines the inside of the uterus grows outside the uterus
- Primary ovarian insufficiency (early menopause), which occurs when the ovaries cease working, and menstruation ends before 40 years old
- Pelvic adhesions, or bands of scar tissue, that bind organs after pelvic infection, appendicitis, or abdominal or pelvic surgery
- Medical conditions associated with the absence of menstruation such as poorly controlled diabetes, celiac disease, and some autoimmune diseases

Making healthy lifestyle choices can aid fertility in ways such as these.[7]

- **Maintaining a healthy weight:** Being overweight or significantly underweight can inhibit normal ovulation.
- **Preventing sexually transmitted infections:** Infections such as chlamydia and gonorrhea are leading causes of infertility for women.
- **Avoiding the night shift if possible:** Regularly working the night shift possibly affects hormone production, so aiming for enough sleep while not working is important if night shift is unavoidable.
- **Not smoking:** Tobacco use is associated with lower fertility because smoking ages ovaries and depletes eggs prematurely.
- **Limiting alcohol:** Heavy drinking is associated with an increased risk of ovulation disorders, and abstinence from drinking is advised at conception and during pregnancy to help avoid the risk of fetal alcohol levels.
- **Curbing caffeine:** Consider limiting caffeine intake to no more than 16 ounces of coffee a day.
- **Being wary of overexercise:** Too much vigorous physical activity can inhibit ovulation and reduce production of the hormone progesterone; therefore, limiting it to less than five hours a week is advised.
- **Avoiding exposure to toxins as much as possible:** Environmental pollutants and toxins such as pesticides, dry-cleaning solvents, and lead can adversely affect fertility.

Menopause

The three stages of menopause are delineated below.[9]

- Perimenopause: Time leading up to menopause, when hormones begin to decline, menstrual cycles become erratic and irregular, and having certain symptoms such as hot flashes and vaginal dryness
- Menopause: When hormones that cause the menstrual period are no longer being produced and the menstrual cycle has discontinued for 12 months in a row
- Post menopause: Time following menopause when symptoms such as hot flashes, night sweats, vaginal dryness, sexual discomfort, depression, changes in sex drive, insomnia, dry skin, weight changes, hair loss, and urinary incontinence emerges
  - Post menopausal women also at an increased risk of developing cardiovascular disease and osteoporosis, with bone loss of up to 25% (about one to two percent per year)
  - Behavioral health issues including moodiness, anxiety, depression due to stress or life changes, sadness over passing reproductive years, and decreased hormone levels

Cardiovascular Health

Heart disease is the *leading cause* of death for US women. This is a surprising fact for many, especially because it can affect women of any age.[10] In 2021, nearly 311,000 women succumbed to heart disease, translating into one in every five female deaths. The most common types of heart disease in women are coronary artery disease, arrhythmia, and heart failure. Symptoms can seem vague, questionable, or even absent to those experiencing them. How many of you experienced nausea, vomiting, or fatigue recently? Did you suspect heart disease? Chances are, you probably did not.

Heart Disease Symptoms

- No symptoms at all
- Angina
- Pain in neck, jaw, throat, upper abdomen, back
- Nausea
- Vomiting
- Persistent or excessive tiredness or sudden fatigue
- Heart attack
- Palpitations
- Shortness of breath
- Feet, ankle, legs, abdominal swelling

Risk factors for heart disease in women include having a history of the ailments listed below. Remember "one in every five female deaths" are attributed to heart disease.[10]

- High blood pressure:
  - Impacts greater than 56 million, or 44 percent, or one in five women, of reproductive age
  - Frequently underdiagnosed, with less than one in four with high blood pressure well controlled
  - Black women are nearly 60% more likely to experience high blood pressure than White women
  - Pregnant women with high blood pressure are at twice the risk of developing heart disease later in life compared to pregnant women without; high blood pressure presents in one of every eight, or 13%, of pregnancies in the US
- High, low-density lipoprotein (LDL) cholesterol level
- Smoking
- Diabetes
- Overweight
- Unhealthy eating
- Physical inactivity
- Too much alcohol consumption
- Stress and depression
- An early first period, before 11 years old
- An early menopause, before 40 years old
- Polycystic ovary syndrome
- A preterm delivery
- A low or high birth weight infant delivery
- Hypertensive disorders of pregnancy

Stroke

As with cardiovascular conditions in general, research indicates women frequently present with atypical, subtle, and vague symptoms for stroke, which is the fifth leading cause of death in women according to the US Centers for Disease Control and Prevention.[11] With a delay in diagnosis and treatment arises the greater likelihood of permanent disability or death. BE-FAST is a mnemonic phrase that can be used to identify the onset of a stroke: Balance loss, Eyesight changes, Face drooping, Arm weakness, Speech difficulty, and Time to call 911. Additional less noticeable symptoms with women may present such as severe headache, generalized weakness, fatigue, shortness of breath, chest pains, nausea, vomiting, brain fog, and hiccups. Less estrogen (not resolved with synthetic replacement) and age are the contributing factors to stroke onset over their lifetimes. Although for younger women, pregnancy and the postpartum period can triple the risk of stroke because of blood clot development during pregnancy, and the 10% incidence of preeclampsia also increases stroke risk.

Knowing many women likely have some of the risk factors identified above during their lifetime, discussing potential mitigations such as those below with their primary care physicians is certainly recommended.[11]

- Knowing blood pressure readings
- Testing for diabetes
- Quitting smoking
- Getting at least 150 minutes of physical activity each week, even short stints
- Making healthy food choices
- Having a healthy weight
- Limiting alcohol to one drink a day (or to none if pregnant)
- Managing stress levels by finding healthy ways to cope

Breast Cancer

Many readers likely know that, except for skin cancer, breast cancer is the most common type of cancer in women, accounting for about 30% of all new female cancers annually, and only lung cancer kills more women.[12] The American Cancer Society provides the below breast cancer estimated statistics for women in 2023. As with many serious health conditions, variations in breast cancer exist for certain racial and ethnic groups.

- Approximately 297,790 new cases of invasive breast cancer will be diagnosed.
- About 55,720 new cases of ductal carcinoma in situ will be diagnosed.
- White, Asian, and Pacific Islander women are more likely to be diagnosed with localized breast cancer than those who are Black, Hispanic, American Indian, and Alaska Native.
- American Indian and Alaska Native women have the lowest rates of developing breast cancer.
- The median age of someone diagnosed with breast cancer diagnosis is 62; however, the age is slightly younger for Black women at 60, and Black women have a higher chance of developing before 40 than White women.
- Overall, the average risk of a woman in the Unites States developing breast cancer is approximately 13%, meaning about a one in eight chance.
- Close to 43,700 women will die; Asian and Pacific Islander women have the lowest death rate.
- The chance that a woman will die from breast cancer is approximately one in 39, or about two and one-half percent, and Black women have the highest death rate, attributed potentially to the fact that one in five Black women have triple-negative breast cancer, which is higher than other racial and ethnic groups.
- Incidence rates are increasing by half a percent per year, although death rates have been steadily decreasing though the decline is slowing slightly. Since 1989 through 2020, there has been an overall decline of 43% likely due to better screening, diagnosis, and treatment overall.
- Currently, the US has four million breast cancer survivors, meaning those still being treated and those who have completed treatment.

Behavioral Health (BH)

BH disorders may affect women and men differently, for example, depression, anxiety, and eating disorders are *more common* in women, and others are *unique to* women such as those triggered by hormone changes from pregnancy, the postpartum period, just prior to menstruation, and/or during peri/menopause. Other disorders may be more evenly distributed across women and men but can *exhibit differently* via symptomatology or course of illness.[13] While biological differences between men and women impact mental health, societal differences also may influence the development of, or make a woman more susceptible to, behavioral health issues. This is demonstrated, for instance, if/when gender determines a degree of power within a culture or society such as when women disproportionately hold a greater burden of caregiving duties, sometimes fostering negative health impacts associated with caregiver stress.[6]

Let us now dig further into BH disorders in women, categorically by age or prevalence. As with most medical issues, identifying these conditions sooner is better, so that the appropriate treatment(s) can be initiated. We will devote a bit more space to BH because of its often co-dependency or co-existence with physical health issues.

Early Childhood

A common childhood BH condition is attention-deficit/ hyperactivity disorder, which is typically exemplified via attention dysregulation, impulsivity, hyperactivity, problems with time management, organization, decision-making, working memory, planning, emotional regulation, and prioritization.[6] The fact that girls are about half as likely to be diagnosed than boys may have more to do with symptom presentation than the actual presence of the disorder. This is because girls exhibit symptoms

differently — more inwardly and verbally, making diagnosis more challenging. Being un- or misdiagnosed can cause self-esteem issues, resulting in eating disorders, anxiety, and/ or depression in girls. Furthermore, girls *having* the diagnosis frequently also may have co-morbid, BH disorders such as bulimia, binge eating disorder, substance misuse, and self-harm.

Adolescence

Adolescence is a time when BH disorders begin to emerge, especially eating disorders, anxiety, and depression, and they may present in combination.[6,14]

- Depression is the most common BH condition in women, who are twice as likely to suffer from this as men. In fact, the prevalence of clinical depression in the US is an estimated 12 million women, which is about one in eight at some point in their lifetimes, with the highest occurrence in ages 25 to 44. A multitude of potentially intertwining conditions may result in depression in teen girls such as weight issues, problems with friends, long-term bullying, academic problems, or witnessing or experiencing physical or sexual violence. In women in general, contributing factors include biological differences such those that are developmental, reproductive, hormonal, and genetic in nature or may be related to social factors such as work stress, family responsibilities, expectations in their roles as women, abuse, and poverty.
- Anxiety is also a common female adolescent BH disorder, sometimes exhibiting as panic disorder or generalized anxiety disorder. It is commonly caused by pressure to perform, hormone production fluctuations, continued frontal lobe development, and may manifest alongside depression and substance misuse.
- Eating disorders are most common in teens and young women, who are held to unrealistic beauty standards, posted prolifically through social media, and are likely linked to genetics and biochemistry as well. Behaviors such as self-induced vomiting, eating restriction, overeating, and the use of laxatives can harm the heart, major organs, bones, and teeth and lead to other diseases due to nutrition deficits. Eating disorders frequently require a stint(s) of inpatient care to provide more intensive therapy.

Reproductive-Related

Reproductive-related BH conditions are those associated, or triggered by, normal hormonal fluctuations, genetics, or biochemistry.[6] These include disorders such as premenstrual syndrome (PMS), which may be magnified in the presence of anxiety or depression; PMS dysphoric disorder, which presents as a more severe form of PMS; postpartum depression; postpartum psychosis; and menopause. All these categories may be heightened due to hormonal fluctuations, coinciding with BH disorder tendencies, genetics, psychosocial factors, or other life pressures such as caregiving responsibilities or work-related stress.

Substance Addiction

Although women are less likely than men to become addicted to substance, their progression to dependence is more rapid.[6] Teen drinking, which can be harmful to brain development, and binge drinking among women are on the rise.

Borderline Personality Disorder (BPD)

Unlike other conditions that tend to be underdiagnosed in women, BPD tends to be over-diagnosed and is believed to be caused by a combination of genetics, environmental factors, and brain function, making this a particularly challenging condition to diagnose and treat, especially since BPD may co-exist with other BH conditions.[6] Women who have this condition may struggle with symptoms of instability in behavior, mood, self-worth, relationships, self-doubt, unworthiness, feeling misunderstood, emptiness, self-image, and heightened fear of abandonment. Sometimes, they may hold intense feelings of anger, depression, and anxiety that are variable in length of time, and they may become easily bored, impulsive, engage in risky behaviors, or have irregular self-identity. All these can impact their employment, life goals, and relationships.

Bipolar Disorder

Bipolar disorder is a serious mental health issue, causing patients to fluctuate rapidly between episodes of mania and depression, and pregnancy, menses, and menopause can all impact the frequency and severity of symptoms.[6] Women and men are equally likely to develop bipolar I disorder; however, women are more likely to develop bipolar II disorder, meaning they may experience more rapid cycling of episodes. Women patients frequently develop other physical and behavioral health ailments such as substance use disorders, depression, thyroid disease, obesity, migraines, and postpartum depression and psychosis.

Dementia

The most common form of dementia is Alzheimer's disease, which is more common in those beginning at age 65 years old.[6] Of these, women comprise close to two-thirds of Americans living with Alzheimer's disease. Symptoms of Alzheimer's disease may include forgetting the names and faces of loved ones, an inability to manage day-to-day activities such as household chores, getting dressed, and managing finances.

Dental Health

A connection between the hormonal changes associated with menopause and dental health may surprise the reader. Of more than 1,000 women surveyed, aged 50 years old and older, 84% claimed to *not* be aware of the potential impact of menopause on oral health.[15] In fact, 70% had experienced increased oral health symptoms during menopause but only one in 10 were aware of a connection. Symptoms include dry mouth, reduced saliva production, receding or bleeding gums, tooth sensitivity or pain, and decay. Furthermore, if a postmenopausal women is taking a medication that exacerbates dry mouth, the symptoms are magnified. This is fairly common, knowing that more than 400 medications potentially cause dry mouth.

Musculoskeletal Health (MSK)

MSK diseases are the leading cause of chronic pain and disability worldwide with an estimated 1.71 billion people impacted.[16] Women consistently demonstrate more prevalent and severe clinical presentations of MSK disorders, and this disparity increases in magnitude with age, possibly due to differences in hormones, immune system functioning, and pain perception differences. With improved understanding of these mechanisms, we are positioned to create more targeted treatments to help offset treatment disparities. Four of the most common MSK pain and disabling disorders include neck pain, low back pain, osteoarthritis, and rheumatoid arthritis.

- **Neck Pain:** In general, the prevalence of neck pain, regardless of source, is higher in females, and for all patients, is exacerbated with the societal shift to working at a desk most of the day. Physical causes of higher female incidence may be the smaller supporting cervical vertebrae, less muscle strength, and ligament stiffness that may lead to increased pain, decreased stability, reduced range of motion, lower tolerance limit for lower neck shear force, and faster muscle reaction times resulting in greater tissue strain and injury potential. Additionally, an estimated 10% of neck pain cases are associated with conditions more prevalent in the females such as polymyalgia rheumatica, fibromyalgia, and rheumatoid arthritis.

- **Low back pain:** Low back pain is the most prevalent MSK condition in the US and has been the single leading cause of disability worldwide since 1990. The prevalence of low back pain increased from 377.5 million in 1990 to 577 million in 2017 and continues to increase with an aging overall population. Again, the prevalence is higher in females across all age groups and similar to neck pain, more studies endorse a biopsychosocial model of pain.
- **Osteoarthritis:** Osteoarthritis affects about 300 million people worldwide and is the leading cause of disability in older adults, with an estimated 10 to 15 percent over age 60 having some degree of osteoarthritis in one or more joints. Females hold a higher risk of developing osteoarthritis, especially after menopause. Those over the age of 55 tend to have more severe osteoarthritis in the knee; however, they are three times *less likely* to undergo hip or knee arthroplasty than males.
- **Rheumatoid arthritis (RA):** RA patients exhibit the same symptoms as those with osteoarthritis including pain and stiffness in the joints but with different underlying pathology. Unlike osteoarthritis, RA is an autoimmune disorder in which the immune system attacks cells in the joints, causing inflammation, swelling, and pain. Many autoimmune disorders display a disproportionate burden where females are afflicted at greater rates than males, and the primary characteristic differences can be categorized into epidemiology, disease-course, and management, leading the experience of the disease to differ.

Neurological Conditions

For at least six neurological conditions, the risk factors, symptoms, and rate of disease progression vary by sex: Alzheimer's disease, epilepsy, migraines, multiple sclerosis, Parkinson's disease, and stroke (the latter, which was covered under cardiovascular in this paper).[17]

- **Alzheimer's disease:** Women represent two-thirds of those diagnosed, and women over 70 are diagnosed sooner than men. Interestingly, this could be due to the fact that women are more likely to stay active once they retire. Noticeable functional decline appears to have a correlation with *more* activity.
- **Epilepsy:** While the risk of recurrent seizures is similar for women and men, the prevalence is slightly less for women. However, symptomatology appears to differ with heart palpitations, chest pain, nausea, visual distortions, and psychic symptoms; hormones seemingly impact the ebb and flow of symptoms. Estrogen lowers the seizure threshold, and progesterone raises the threshold, causing seizure clusters around ovulation and menstruation, with other fluctuations occurring during puberty, pregnancy, and menopause.
- **Migraines:** Women are about three times more likely to suffer from migraines than men, but are also diagnosed sooner because women tend to seek treatment for the symptoms more often. These, too, can be connected to hormonal fluctuation, with worsening of symptoms around menstruation.
- **Multiple sclerosis (MS):** Primary progressive type is equally prevalent in women and men; however, relapsing-remitting type is three times more likely in childbearing aged women. Women tend to present with symptoms about five years sooner, so are diagnosed sooner, recover faster from flare-ups and have slower disease progression than men. This may be linked to an estrogen protective effect pre-menopause.
- **Parkinson's disease (PD):** Women are not as likely to be diagnosed with PD and because of this, may go misdiagnosed, and when diagnosed, at a more progressive stage. And again, the symptom of tremors that is typically associated with PD are not as likely in women, who instead may experience cognitive changes, depression, fatigue, and stiffness. The protective effects of estrogen may also contribute to a later onset in women.

Intimate Partner Violence (IPV)

Women's health insights, unfortunately, are not complete without addressing domestic violence. Abuse or aggression that occurs in a romantic relationship is the definition of intimate partner violence and refers to current and former spouses and dating partners.[18] The frequency and severity can vary and can range from one episode that may have lasting impact to chronic to severe episodes over multiple years. Commonly associated behaviors include physical and sexual violence, stalking, and psychological aggression. They are connected to other forms of violence as well and are correlated to major health issues and economic consequences. Here is a startling statistic: **One in three women worldwide has experienced either physical and/or sexual intimate partner violence or non-partner sexual violence in their lifetime.**[19] The effects of abuse can last a lifetime and may surface physically or emotionally.

Gender Identity

Gender identity is different than our sex, the biological and physiological characteristics with which we were born.[19] Instead, gender identity refers to a person's deeply felt, internal, and individual experience of gender that is also socially constructed, meaning norms, behaviors, roles, and relationships of women and men. Because of the societal aspect, gender varies across different societies and over time. As mentioned earlier in the BH section, gender may promote inequality that also intersects with other social and economic inequities as well as discriminatory practices. Access to health care is no exception because gender influences people's experience of, and access to, health care, and lack of training and awareness amongst health care providers and health systems of the specific health needs and challenges of women and girls are issues to be addressed more comprehensively. Rigid gender norms also negatively affect people with diverse gender identities, who often face violence, stigma, and discrimination as a result, even in health care settings. Because of these elements, women and girls face greater risks of unintended pregnancies, sexually transmitted infections including human immunodeficiency virus, cervical cancer, malnutrition, lower vision, respiratory infections, malnutrition, elder abuse, violence, female genital mutilation, early/ forced marriages, mental health issues, suicide, and more. The World Health Organization (WHO) supports country-level action to strengthen health sector response to gender-based violence, equality in health workforce development, and barriers to health services. WHO supports the advancement of the Sustainable Development Goals (SDG), and the two below are especially noteworthy.

- SDG 3: Ensure healthy lives and promote well-being for all.
- SDG 5: Achieve gender equality and empower all women and girls.

Social Determinants of Health (SDOH)

We, in the health care industry, speak of SDOH almost daily, spewing the acronym as if we are experts in all the complicated facets of what this means to someone actually living a type of SDOH experience every day. Many jump immediately to the conclusion that this term only applies to those in poverty; this assumption shortchanges the entirety of complexities of the term. While poverty is indisputably a significant SDOH factor that also sets the stage for numerous other SDOH issues, other elements, even without poverty, also deserve the designation of being a SDOH and require consideration of their impacts to someone's health journey. Sadly, an all-too-common example is the issue of loneliness amongst our senior population that may be exacerbated by declining mental and physical health, inability to drive, distance from relatives, cultural ageism, negativity towards aging, and declining ability to take care of day-to-day responsibilities.

> *Some significant social factors that have disadvantaged women include exclusion in medical research, stigma of discussing normal reproductive health topics, domestic violence and trafficking, and racism reflected in maternal mortality.*

Here is a concisely written definition from the US Department of Health and Human Services' Healthy People 2030 initiative: "Social determinants of health (SDOH) are the conditions in the environments where people are born, live, learn, work, play, worship, and age that affects a wide range of health, functioning, and quality-of-life outcomes and risks."[20] They further categorize SDOH into five core domains.

1. Economic stability
2. Education access and quality
3. Health care access and quality
4. Neighborhood and built environment
5. Social and community context

Human health is socially patterned. As a category, how we understand women's health is influenced by our culture, government, clinical care, and scientific findings.[21] Some significant social factors that have disadvantaged women include exclusion in medical research, stigma of discussing normal reproductive health topics, domestic violence and trafficking, and racism reflected in maternal mortality. Research has revealed patterns within the US that women's longevity is declining relative to those in other high-income countries due to gaps in knowledge about debilitating conditions that affect millions of women exist, and deep inequalities in society with respect to accessing health care are experienced. This is difficult to grasp and resolve, to say the least, because this is not a singular or linear root cause analysis. Nonetheless, growing progress can be made with multi-level, intersectional initiatives approaching women's health holistically throughout their lifetimes.

Health disparities are also heightened and exemplified differently in rural areas as compared to metropolitan/ urban areas. Even though national data is limited regarding health outcomes for women in rural areas, disparities are readily apparent and include higher rates of conditions and behaviors such as:[22]

- Self-reported fair or poor health status
- Unintentional injury and automobile-related deaths
- Cerebrovascular disease deaths
- Suicide
- Cigarette smoking
- Obesity
- Cervical cancer
- Ischemic heart disease deaths
- Alcohol consumption
- Nonadherence to preventive screenings

Did you know that rural America is home to almost 23 percent of all women 18 years and older?[22] Because of this, the health care industry can hardly choose to passively view disparities embedded in nonmetropolitan areas where health care access may be very limited, particularly with respect to higher level specialties. Health care access dynamics are dually pronged: patient factors and care delivery.

- Patient Factors: While rural obstetric outcomes appear to be mostly on par with urban areas, obstetric risks vary by levels of rurality in many areas of the US. To illustrate, rural residents are more likely to be poor, lack health insurance, have less available technology such as internet, and the need to travel further for health care. Moreover, prenatal care initiation in the first trimester is lower, hospital rates with pregnancy complication rates are higher, receipt of reproductive health services by sexually active women aged 15 to 44 is less likely, reliance on female sterilization is higher, and contraceptive use planning is lower, resulting in more unintended pregnancies.
- Care Delivery: The ratio of obstetrician/ gynecologists per 10,000 women is highest in urban areas, with lower rates in rural areas, where in some locations, family physicians provide all obstetric care, although this number is declining, with only about 19 percent providing routine deliveries. In parallel, more women are specializing in obstetrics and family practice but less women physicians than men practice in rural areas. Additively, this also translates into a further distance to sub-specialty hospitals that have more experience with low-birth-weight infants, which when paired with lower levels of prenatal care, and may result in these patients being delivered in less specialized settings.

Another potential driver of less-than-optimal access in certain locations could be an output of health delivery system consolidation. While consolidation can support smaller or financially struggling hospitals with a more funded and consistent framework within a care region, hence offering more up-to-date testing and health services, this activity can also change the landscape exponentially within a geography that has less accessibility to health care. This is due to multifaceted forces such as the composition of individual practitioners changing from whom residents have become accustomed to receiving care, undermining preventive care and adherence to treatments—or changes in how care is delivered, requiring a shift in thinking about how care can be rendered, which could be positively or negatively perceived. For example, providers being purchased by payors may seem unconventional, clinical care offered in retail settings may seem out of place, and a health system in an urban setting buying rural, community hospitals may cause concern over a localized approach to care. These ever-evolving realities bring varying levels of change, not only in sites of care, but also could impact fees, types of practitioners, and levels of care in the community.

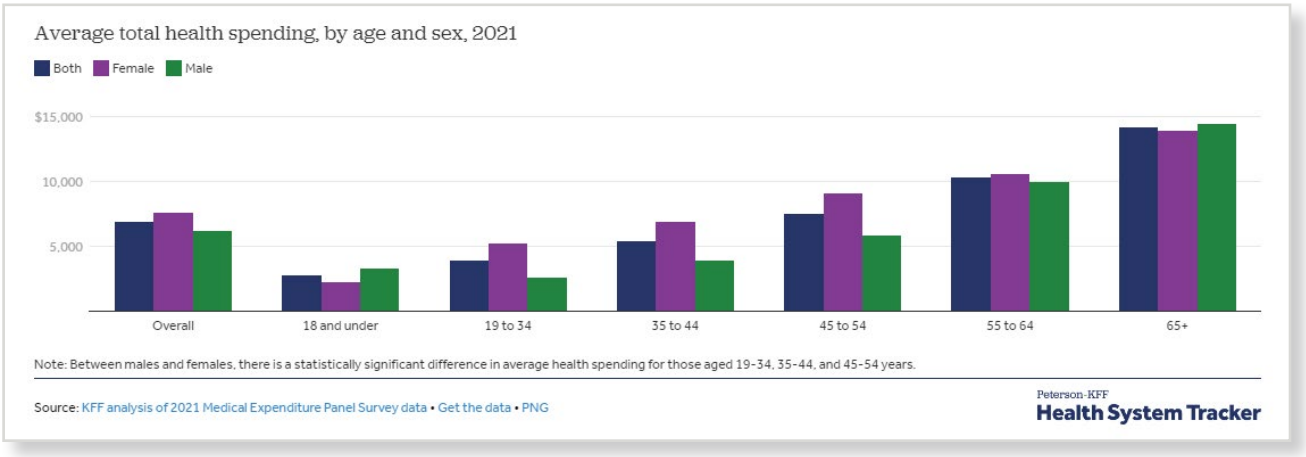
Recommendations for health industry stakeholders that need to be at the forefront of health care inequity efforts for rural areas include:[22]

- Collaborate with maternal-child and rural health agencies to better identify health needs and barriers in their location
- Partner with family physicians to ensure training and consultation are available to them
- Promote state financial incentives to rural health providers
- Encourage new physicians to practice in rural locations in exchange for loan repayment or other medical programs
- Raise need for regionalized perinatal care
- Bolster telemedicine and other technology capabilities
- Increase contraceptive method access
- Incorporate place of residence in data collection databases to elevate understanding of rural location impacts to health
- Catalyze more comprehensive research on the numerous types of rural health disparities

Health Care Approach and Recommendations

Perhaps not surprisingly, health spending increases as individuals age, and this trend persists by insurance status and sex.[23] Women have higher health spending than men in their 20s through early 40s, and this is largely due to pregnancy and delivery-related care, although spending differences between men and women are not statistically significant in older age groups. Those who are 55 years old and over drive over half of total health spending, despite comprising about 30% of the population. Of course, averages are just that and do not represent individuals and their unique conditions or health needs. No one claims that deciphering complex physical, behavioral, societal, and cultural dynamics to health is a simple task, but we have the crucial, foundational elements available to us, progress has been made, and many new companies and solutions are emerging to address women's health.

Figure 1. Average total health spending, by age and sex (2021)[23]



Furthermore, even though we have reviewed that women tend to delay care and are underserved by the medical community in certain ways, this is not mutually exclusive with the fact that women still control an estimated 80 percent of healthcare spend in the U.S., which is close to a four trillion dollar industry—they are simply mostly spending the dollars for others.[24] The health sector is starting to realize this, and this realization has prompted billions of dollars in funding towards women's health digital start-ups. This activity and marketing of these start-ups, in turn, has caused exponentially more focus on women's issues. But to maintain perspective, of digital dollars spent, only about five percent of the total is directed towards women's health, with even less directed towards women's health research and development for new products, services, and women-specific research. A large opportunity for digital health to step in and enable detection of early signs and health predictors that may help women recognize their conditions, and then make useful lifestyle decisions to manage their health exists.[2] Women-oriented point solutions are coming out of the woodwork, and the majority of point solutions focus on fertility, obstetrics, and even BH, but not so much around menopause. In addition to promoting more digital health solutions, even more importantly, we are obligated to encourage and develop holistic approaches to women's health, or we risk further care fragmentation. A point solution may help a specific condition for a period of time but does not, alone, address health issues comprehensively or in a streamlined manner when other coexistent issues accumulate, contribute, or heighten a health issue.

We have also clearly seen that a one-size-fits-all approach for puberty, menses, fertility, obstetrics, menopause, or heart disease is not sufficient. Solutions and programs should be designed to nimbly follow a woman's health gynecological/reproductive journey in orchestration with other potential co-morbidities such as cardiovascular, behavioral, oncological, and others. Attention to social and lifestyle confounding factors that impact access and freedom in receiving needed care are required. We must relentlessly advocate for education, attention, support, and engagement of women through multiple modalities that are convenient to access, with messaging that stresses the importance of "placing your own mask first to better serve others." Brick and mortar, digital, telemedicine, home care, coaching, advocacy, and care coordination through all stages are imperatives. Recognition of competing caregiving demands and scheduling barriers is imperative to inform care plans that can be followed adherently.

Supporting, educating, and investing in primary care so that practitioners are empowered to deliver preventive care, identify barriers to health, practice at the tops of their licenses, and coordinate effectively with specialists and ancillary providers are paramount to reaching women early and with less delay. When women do come forward with ailments, taking their symptomatology seriously through a personalized approach that considers their unique circumstances and presentation must be at the forefront.

Personalized medicine ideally sits within a population health framework for practitioners, wherein robust analytics are available, guiding them to patients identified through predictive modeling for intervention and offering evidence-based medicine guidelines for high quality, efficient care, that when followed, is incentivized and rewarded through the use of value-oriented reimbursement structures. These practices must be supported through interoperability investments, so that physicians can reach across into facility care and ensure follow ups and adherence to therapies are monitored.

Now that we have explored common and significant health concerns of women, how women may experience symptoms differently, and how this can dramatically change over the course of a lifetime, we must be compelled to develop more effective approaches in facing these complex dynamics and in a way that is coordinated, respectful, and mindful of potential cultural or social catalysts that are complicating care coordination and treatment plans.

Let us consider Olivia:

Olivia is 15 years old and works hard in school. She has her mind set on an aggressive track to her favorite college, and she knows her family cannot afford for her to go without scholarships. She is also developing into a young woman, physically, quite rapidly this year. She used to be on the track team but stopped due to an ankle injury. Between puberty changes and less activity, she is gaining a little bit of weight but all within normal, healthy amounts for her age. However, with all the social media showing perfected body images, she is worried she is too heavy, and has begun to progressively restrict her caloric intake. She has considered purging after heavy meals and checks her reflection more than ever. She has always been the quiet type, so her parents have not noticed her drawing more inwardly as she reflects on her perceived flaws. They attribute mood changes to friend issues or pubescent hormonal changes.

Imagine Monique for a moment:

Monique is 37 years old and pregnant after two years of infertility treatment. Her partner works shift work and has demanding hours. Her own job requires long hours, her pregnancy is causing nausea and fatigue, and her blood pressure has become elevated. Unfortunately, soon after welcoming a beautiful baby boy, Monique suffers a deep depression, with recollections of her own childhood when she was neglected and often felt alone. Her worry is growing as she contemplates how she and her partner will manage with both of them working without family nearby. How can they adequately care for their baby? How can she possibly breastfeed and go without sleep? How can she regain her figure to maintain her partner's interest and her own goals? How can she fit in another pregnancy before her eggs are depleted, and also continue to check in on her father regularly, who is starting to become ill from early signs of dementia? Not so long ago, Monique would never have mentioned feelings of postpartum depression because she would have feared that others would chastise her for not feeling grateful for their healthy baby, and she is still not sure she should.

Or we can meet Silvia:

Silvia is 65 years old. Her husband of 37 years died from COVID-19 during the public health emergency. She is going through menopause, with weight gain and temperature changes, has occasional back pain, lower limb swelling, and growing fatigue. She continues to work to stay busy and assumes her symptoms are mostly part of the grieving process. Silvia is finding home maintenance and repairs challenging and expensive without a partner and additional income. She also likes to help care for her grandchildren because they make her feel special and active, and this really helps her son's young and growing family as they manage numerous obligations. Many women set aside themselves or discount unwell feelings until the time is too late, and oftentimes as with Silvia, the emotions associated with grieving and physical ailments comingle, making the discernment of symptomatology difficult.

How do we begin to address these issues? While each scenario requires a personalized patient-first approach, these three scenarios hold common factors, with a few listed below.

1. Physical and behavioral issues are intertwined, so medical and behavioral cannot be siloed—they need to be well coordinated.
2. None is gaining the attention of others because they are "self-treating" by either dealing on their own or attributing their issues elsewhere. Targeting at risk populations through predictive modeling, outreach, and motivational interviewing is necessary.
3. Their symptoms could easily be misclassified as other conditions, so exploring alternative diagnostic paths may be indicated.
4. All have multiple, competing life circumstances they are juggling, making procrastination in treatment and thinking of other important goals "easier" than worrying about their own health. Education and emphasis on lifestyle choices need to be an integral part of the physician-patient relationship.
5. Each one has a potential stigma involved that may garner embarrassment or hinder reporting of symptoms (i.e., image concerns, depression symptoms, financial constraints, post-menopausal indicators). Discussing issues openly without blame, shame, or judgment is imperative.

In conclusion, women's health evolves over a lifetime and each stage requires a personalized, coordinated, outcomes-based approach that elevates proper diagnosis, evaluation, and dismantling of assumptions used for men's health or the general population. Helping women understand the importance of lifestyle choices and prioritization of care is highly important. Recognizing social and cultural impediments to a fully actualized health journey must be a part of all health care including for women, who have not historically been included in medical research, who have been discounted for hormonal fluctuations, who are responsible for 80% of medical spend for their families, but sometimes delay care for themselves. Digital solutions are on the rise, but alone, cannot account for the holistic approach necessary to coordinate care across primary care, specialist care, virtual, worksite, home, or digital engagement. Behavioral and medical health need to be in sync with a whole person approach, so that the entanglement of symptoms do not become a hurdle to effective treatment. All humans deserve access to high-quality health care and through a variety of options that meet demanding schedules and responsibilities. Let us take steps to elevate *all those* with different presentations of disease, supported by population health tactics, evidence-based medicine, and personalization in care—and celebrate the women in our lives!

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