RISK strategies CONSULTING

WHITE PAPER

Reproductive Health

The New View of Fertility and Employee Support

Introduction

Issues, concerns, and questions surrounding fertility are important, frequently emotionally charged, and are top of mind for most people at some point in their lives for a multitude of reasons. After all, fertility for females may span a staggering 30-plus year period of time and much of the lifetime for males. Because these factors may arise or be sought across distinctive chapters within a lifetime, the views about fertility and its impact on individuals and families can dramatically evolve depending upon the specific point in time within the life journey they emerge. The counter to fertility prevalence, infertility rates, increase for males and females as we age, with declining quantity and quality of our respective reproductive assets; that is, sperm and eggs. Impacts on the health of our reproductive systems are notably complex and varied and sometimes frustratingly not understood, although great strides have been achieved in diagnosing and treating infertility as well as offering more options to would-be parents in reproduction. This paper offers current statistics regarding fertility prevalence and infertility rates, factors impacting both, emerging options for those desiring children, resources, and recommendations for an integrated whole health approach.

Employer Group Implications

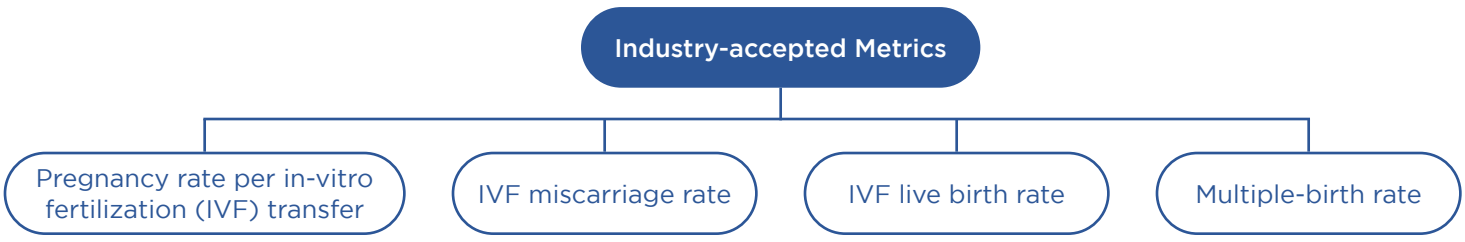
Fertility issues can span decades of life and become intertwined or confounded with other medical and socioeconomic or family-related conditions. Most employers are recognizing the critical need to incorporate more innovative and forward-thinking approaches to total health and wellness, which rightfully and more frequently, is inclusive of fertility benefits. These benefits are frequently aligned with fertility point solutions, specialized in fertility management, in addition to overarching care management programs and specialist involvement. This added layer of expertise, in addition to a patient's primary care and reproductive health practitioners, can bring more visibility to available options for families and provide fertility programs tailored to specific needs. This more focused approach can increase care quality and save medical costs, which in turn, may correlate to employee loyalty, better productivity, and less absenteeism. The following exemplify the importance of these programs to employees.

45% of workers say fertility is an important component when considering a new job[1]

68% of adults would switch jobs for better fertility benefits[2]

59% of employers say that fertility coverage is necessary to compete in the labor market[2]

Any such fertility solutions should be evaluated for quality of care and outcomes-based orientation, supported by evidence-based medicine principles. Health outcomes data analyses are a necessity to substantiate any declared value proposition. Data is essential for employers to measure and understand the overall impact of a fertility benefit for their employees including the measurement of intended outcomes, as well as how individuals' health and lives are impacted throughout the journey, short and longer term.[3] Industry-accepted metrics are included below, which need to be curated and evaluated consistently, compliantly, with statistically relevant volume, and validated. Their impact in helping patients achieve pregnancy sooner, use less treatment and medications, experience fewer miscarriages, and produce healthier pregnancies and babies is of great magnitude.



Prevalence Statistics

According to the World Health Organization, an estimated one in six, or 17.5%, of the adult population worldwide experience infertility.[4] To further level-set on prevalence across various populations, the 2023 Centers for Disease Control and Prevention National Health Statistics Report details fertility statistics in the United States (US), based upon 21,441 (9,746 men and 11,695 women), in-person, nationally representative, sample interviews for men and women, aged 15 to 49, from 2015 to 2019 (as compared with those from 2011 to 2015).[5] Response rates were 66% for women and 62% for men. Fertility measures included having had any biological children, the number of biological children, parent age at first child's birth, birth intervals for women with at least one child, and the marital and cohabiting status at the time of the first child's birth. As with most health indicators, certain differences exist across education, income, and ethnicity. A few of these statistics are noted below (percentages rounded).

Women & Men

	Aged 40-49	Aged 15-49	First Birth
	84% of women had given birth	**57%** of women had a biological child on average, women had **1.3** biological children	**24.1** mean age for women
	77% of men had fathered a child	**45%** of men had a biological child on average, men fathered **0.9** children	**27.0** mean age for men

- Those with **lower levels of education** were *more likely* to have had
  - A biological child,
  - More children, and
  - First child at younger ages than men and women with higher levels of education
- Those whose **mothers had higher levels of education** were *less likely* to have a premarital first birth than those whose mothers had lower levels of education
- Those who **lived with both parents at age 14** were *less likely* to have a premarital first birth than those who had other types of living arrangements

Women

About one-third had their first birth before age 20, and about one-half did so in their 20s

30% of first births occured during teen years

52% of first births occured during ages 20-29

- Non-Hispanic, Asian women had the **fewest number of children** and the **oldest average age at first birth**, followed by non-Hispanic White women
- The probability of **having a first birth before age 20** was highest for Hispanic and non-Hispanic Black women and lowest for non-Hispanic Asian women

Men

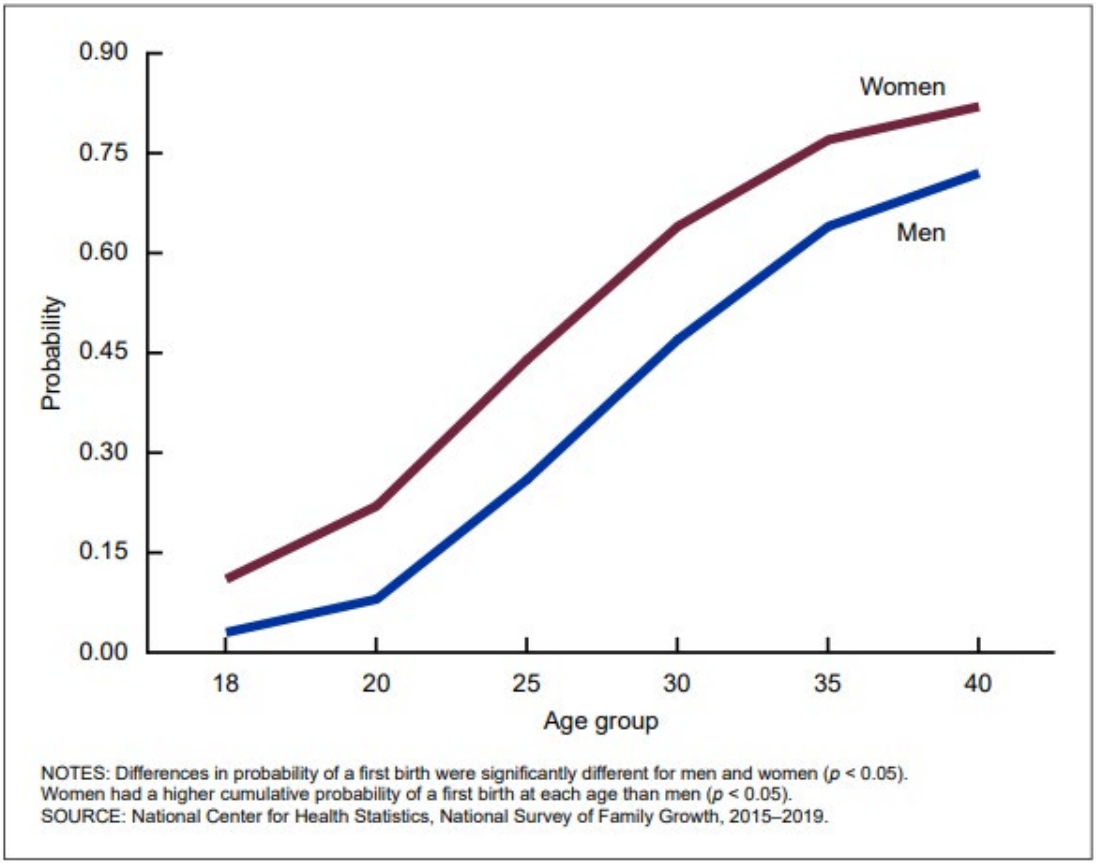
One in 14 fathered their first child before age 20, and more than half did so in their 20s

7% of first births occured at ages younger than 20

58% of first births occured during ages 20-29

The probability of **fathering a child before age 20** was highest for non-Hispanic Black men; followed by Hispanic; non-Hispanic White; and non-Hispanic Asian men

Figure: Probability of a First Birth by Age Groups for US Men and Women[5]



NOTES: Differences in probability of a first birth were significantly different for men and women ($p < 0.05$).
Women had a higher cumulative probability of a first birth at each age than men ($p < 0.05$).
SOURCE: National Center for Health Statistics, National Survey of Family Growth, 2015–2019.

Women's 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.[6] 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, etcetera.[6] 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.[7] However, shockingly, only in recent decades has clinical research been conducted with female participants; prior to this, the vast majority, or all participants were males. This does not just apply to clinical research. Even in preclinical research, 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 addresses sex as a factor in health and disease.[8]

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 (6 - 12 months, depending on the woman's age), then fertility consultation may be a reasonable and desired next step.[9]

At birth, females have all the eggs they will ever have, which is about one million.[10] 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 declines, and the rate of decline increases as women age, which means by age 40, a woman's natural pregnancy chances drop to less than five percent.[10] In addition to age itself, this is also due to diminished egg quality over time with exposure to elements that can damage egg DNA (e.g., illness, toxins, free radicals), making the likelihood of genetic disorders for the baby higher with the mother's age — from two-tenths of a percent in a woman's 20s to five percent in her 40s.[10] 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 years old. Similarly, for women using their own eggs for in vitro fertilization, their birth rates decline about 10% every two years.[11]

In addition to age, numerous medical issues may contribute to female fertility problems such as these as defined by the Mayo Clinic.[9]

- 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, which 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.[9]

- **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 overexercising:** 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.

Men's Reproductive Health

The best methods for protecting men's reproductive health are **ensuring effective contraception, avoiding sexually transmitted infections (STI), and preserving fertility** according to the US Department of Health and Human Services.[12] Deciding on the most relevant method of contraception converges elements relevant to a couple such as age, personal and family histories, frequency of sexual activity, and the desire for children and when. Without consistent, correct usage of contraception, the incidences of pregnancy and STIs are higher. STI testing is of critical importance due to the frequent absence of obvious symptoms and to reduce progression and transmission of symptoms and disease to self and others.

Contraceptive choices for men include the use of condoms and surgical vasectomy.[12] The former, which is intended for one-time use, when made of latex or polyurethane, helps to curb STIs but that is not the case for those made of lambskin. The failure rate of condoms is between 11 and 16%, and for vasectomy, is less than one percent. (Note that with vasectomy, a few months need to pass post procedure before this rate of effectiveness applies.) A vasectomy should be considered a permanent choice for contraception due to reversal unreliability. Vasectomy works by obstructing the vas deferens so that sperm cannot travel from the testes to the urethra, from which sperm is ejaculated to reach a female egg.

Fertility

The most common reasons for male infertility and lower than normal sperm levels are of testicular origin and/or may include hormone imbalances and blockages within the reproductive organs such as a varicocele, an enlarged vein in the testicle, which accounts for about 40% of male infertility. In about 10-15% of infertile men, sperm is nonexistent.[12] Perhaps surprisingly, in about 50% of male infertility cases, the cause cannot be determined.

Additionally, greater than one-third of infertility cases are attributed to male or male-female combination reproductive causes.[12] Elucidating causes for male infertility may require a multi-faceted investigation for indicators.

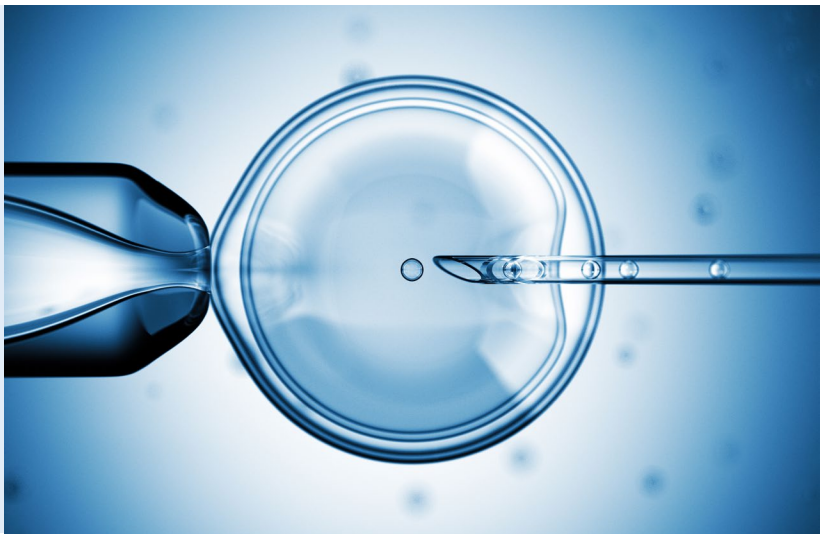
- Hormonal deficiency
- Testicular or penile injury
- Hernia
- Varicocele
- High fever
- Infection
- Childhood mumps history
- Unhealthy, low-quality sperm
- Genetic anomaly

The above may be ascertained through a variety of methods such as physical examination, obtaining an updated medical history, semen sampling, blood testing, testicular biopsy, genetic testing, and observable changes such as increased body fat, decreased muscle mass, and decreased hair growth.[12]

Treatment

Male fertility treatment correlates to the underlying cause, or when the problem has not been identified, to evidence-based treatments that may enhance fertility.[12]

- Surgical correction of anatomic anomalies
- Medical procedures that deliver sperm to the woman
- Lab fertilization of an egg
- Third party sperm donation
- Hormone imbalance or erectile dysfunction medication



Whole Medicine Approach

Those of us in the healthcare industry are reminded to continuously encourage whole-person health, and reproductive health, spanning several decades of life, is certainly no exception to this principle. This, of course, is true for the approach to all medical conditions, where the entirety of symptoms must be evaluated and coordinated across a continuum of care, incorporating areas such as primary care, gynecology, urology, endocrinology, infertility specialists, and behavioral health – and throughout prevention, acute events, and chronic episodes, especially when issues may be related to hormonal imbalance, which may fluctuate or have implications across other biological systems. Having this more holistic approach supports more efficient and high-quality care, which translates into better overall employee health as well as attention to medical costs.

As discussed, fertility is promoted with better lifestyle choices, genetics, lowered age, and more positive socio-economic factors, and when the topic of fertility changes to one of reduced fertility, then patients can become, understandably, highly concerned. Therefore, earlier discussions about reproductive health are highly encouraged. The notion of preventive medicine for fertility needs, except perhaps for the use of prenatal vitamins during planning discussions, has not received the deserved attention. This is at least partially because infertility symptoms are frequently absent, and so the consideration that fertility may be a challenge is not often considered until conception difficulties arise in real time.

Today, people often delay starting family expansion due to educational pursuits, career ambitions, travel, other family responsibilities, or other interests, which may occupy their thoughts in their earlier years of reproduction when people are generally more fertile. However, because fertility may sharply decline with age, enhanced education and awareness are indicated in men and women, who eventually may want to enlarge their family.[13] As previously described, disorders impacting fertility and pregnancy loss increase with age-related fertility; therefore, reproductive health communication with health practitioners needs to be held prior to patients reaching more advanced age, so they have the option to more intentionally plan for reproduction. Due to the growing focus on fertility issues and less stigmatization of the topic, more people are engaging in programs such as egg/ embryo freezing. To illustrate, the Centers for Disease Control and Prevention indicates between 2012 and 2021, the rate of egg freezing within assisted reproductive technology rose from 11 to 40%.[14]

As with the management of any medical condition, ensuring a multi-faceted and panoramic view of the care journey inclusive of fertility is imperative. A few essential elements are these:

1. **Communication and interoperability across the care team — use of electronic medical record connectivity between practitioners, carriers, and point solutions**

   Addressing fertility frequently involves great attention to the timing of the monthly reproductive cycle, medication use and administration, dietary modification, mindfulness of physical activity, and stress reduction. All these may assist or detriment concomitant medical conditions, making knowledge transfer and coordination necessities. This may include direct and non-direct approaches such as through the use of personal physicians and care teams combined with fertility point solutions.

2. **Alternative digital and non-digital communication methods — application, messaging, in-person, virtual**

   Making communication and consultation with the care team, access to education material, appointment scheduling, and medical record review easily accessible are key to patient engagement, adherence, and feeling empowered and involved.

3. Using an outcomes-oriented, value-based approach — quality, cost, and experience standards

- Fertility programs should be held accountable, and rewarded for, meeting evidence-based measures designed to improve care quality, keeping the program affordable, and making the experience as positive and supportive as possible.
- Fertility programs must be highly integrated with both medical and pharmacy benefits administrators with bi-directional data exchange to evaluate the full member journey.
- Fertility programs inclusive of monitoring high-risk pregnancies are valuable as well because in vitro fertilization (IVF) patients may sometimes find themselves in this category. Not only is heightened monitoring important for the mother, but also may help offset the need for neonatal intensive care unit usage, which typically adds concern and costs to families.

4. Recognizing and understanding socioeconomic impacts to accessing overall and reproductive healthcare — nutrition, transportation, technology, home environment and support

Patients at risk for injury, poor nutrition, safe living conditions, and the economic means to seek fertility services need to be more proactively identified through conversation and patient assessment. Having connectivity to supportive community organizations and social programs can have a significant impact on better health.

The American College of Obstetricians and Gynecologists found social determinants of health (SDOH) have been shown to affect numerous reproductive conditions such as preterm birth, unintended pregnancy, infertility, cervical cancer, breast cancer, and maternal mortality.[15] When physicians recognize the importance of SDOH, they can understand their patients better, more effectively communicate about health-related conditions and behaviors and improve health outcomes. In turn, greater awareness of SDOH affirms the intersectionality of how overlapping categories such as social identity, oppression, and discrimination impact and emerge within health outcomes.

While about 85% of physicians in a survey believed that patients' social needs were as critical to address as medical needs, 80% were not confident in addressing these needs.[15] This is not too difficult to understand; after all, these problems have root causes that require policy-level change with designated resources to have a more amplified result. Nonetheless, taking deliberate planning steps and identifying these patients proactively with screening tools within electronic health records (EHR) can set the stage for positive actions that may certainly benefit patients. Here are distinctive steps that can be taken by physicians:

- Screening for SDOH through patient-completed intake questionnaires, expanded medical history questions, and integrated EHR prompts (See screening type categories in **Table 1**[15] on the next page.)
- Medical–legal partnership embedded within obstetrician/ gynecology/ primary care practices that are part of a community health care clinic or network, so that patients can receive assistance with problems such as toxic environmental exposures in their homes, access to stable housing, legal aid for immigration challenges, and other legal matters that directly affect health
- Liaisons with community-based social needs programs that assist with basic resources such as food pantries and home utility bills (See more at healthleadsusa.org.)
- Interpreter services, so that language barriers can be addressed
- Transportation, logistics, and access to public transportation as important considerations when planning office locations

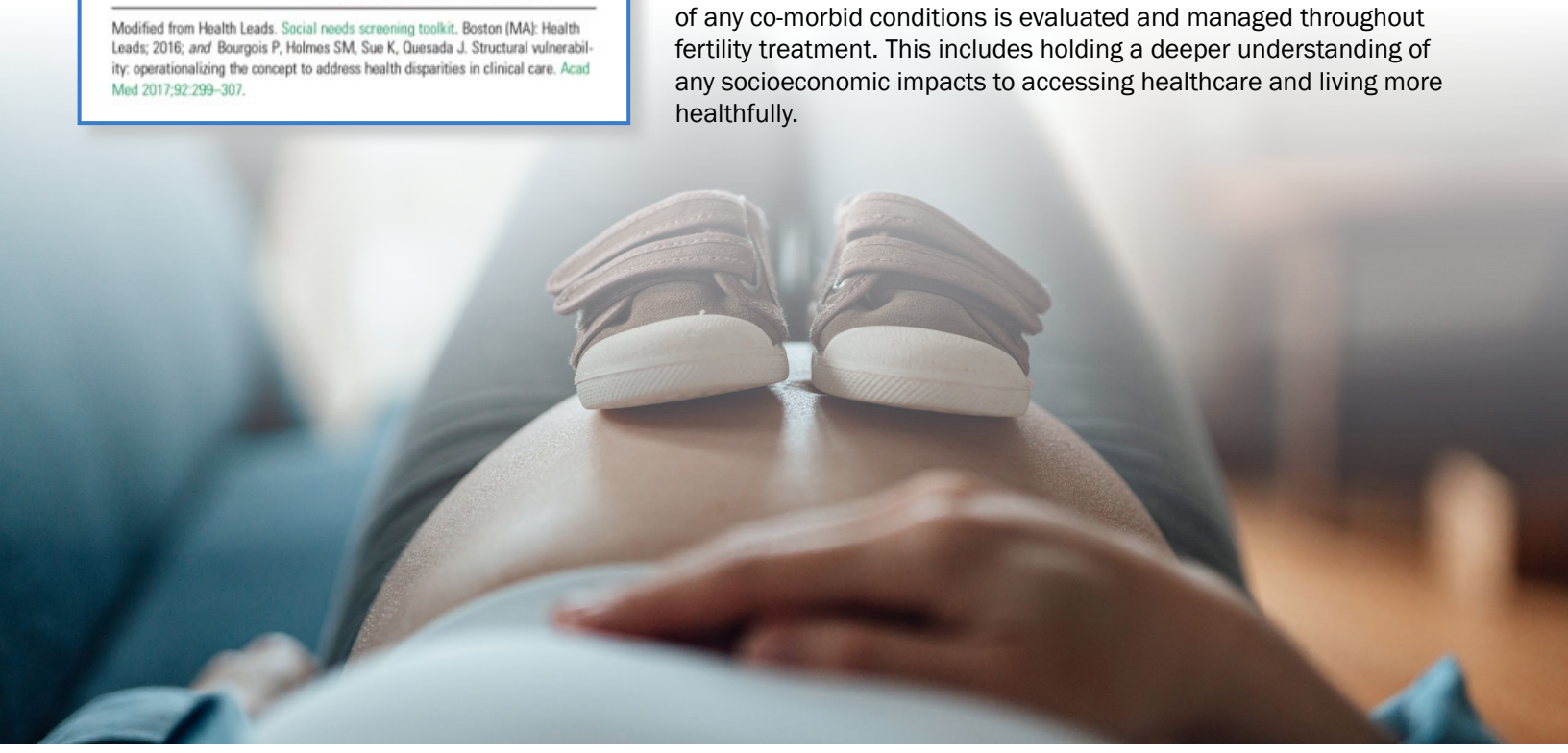
Table 1. Sample Screening Tool for Social Determinants of Health

Domain	Question
Food	In the last 12 months, did you ever eat less than you felt you should because there was not enough money for food?
Utility	In the last 12 months, has your utility company shut off your service for not paying your bills?
Housing	Are you worried that in the next 2 months, you may not have stable housing?
Child care	Do problems getting childcare make it difficult for you to work, study, or get to health care appointments?
Financial resources	In the last 12 months, have you needed to see a doctor but could not because of cost?
Transportation	In the last 12 months, have you ever had to go without health care because you did not have a way to get there?
Exposure to violence	Are you afraid you might be hurt in your apartment building, home, or neighborhood?
Education/health literacy	Do you ever need help reading materials you get from your doctor, clinic, or the hospital?
Legal status	Are you scared of getting in trouble because of your legal status? Have you ever been arrested or incarcerated?
Next steps	If you answered yes to any of these questions, would you like to receive assistance with any of those needs?

Modified from Health Leads. Social needs screening toolkit. Boston (MA): Health Leads; 2016; *and* Bourgois P, Holmes SM, Sue K, Quesada J. Structural vulnerability: operationalizing the concept to address health disparities in clinical care. Acad Med 2017;92:299–307.

Ideally, people are engaged in conversation sooner in their adult lives regarding reproductive planning, so they are more educated on reproductive health and can consider, more intentionally, options for themselves and their families as they age and work towards maintaining healthy lifestyles. Once involved in fertility goals or programs, being connected to the right practitioners and having access to specialized programs and point solutions could enhance the experience. These programs being embedded within a whole-person, value-based, outcomes-oriented care model is an ideal approach to increasing quality, providing more efficient services, enhancing the patient experience, and incorporating the treatment of any comorbid conditions.

In conclusion, reproductive health for men and women may be a topic of great joy, despair, or both for families, and this can vary throughout life. Raising awareness of the impacts on fertility and what is within the control of patients is highly important, so that patients can make more informed decisions, seek treatments they may need, and understand alternatives available to them. Employers have responded by offering fertility benefits because they are increasingly aware of the importance of fertility as a core component of overall health and one of great importance to employees. As with the management of any medical condition, improved reproductive health can have a very real impact on productivity, loyalty, and most importantly, overall health and well-being. Therefore, a whole-person approach to reproductive health is necessary to ensure that patients' total care is considered, and that treatment of any co-morbid conditions is evaluated and managed throughout fertility treatment. This includes holding a deeper understanding of any socioeconomic impacts to accessing healthcare and living more healthfully.



Citations

1. Leonhardt, M. (2022, March 5). *Fertility benefits have become a major weapon in the war for talent.* Fortune. https://fortune.com/2022/03/05/fertility-benefits-are-a-major-weapon-in-the-war-for-talent/
2. Gonzalez, O., & Dreher, A. (2022, October 11). *Employers expand reproductive health benefits amid tight labor market.* Axios. https://www.axios.com/2022/10/11/fertility-benefit-reproductive-health-labor
3. Progyny. (2022) *Employer Workbook: Understanding Clinical Outcomes in Fertility.*
4. World Health Organization. (2023. April 4). *1 in 6 people globally affected by infertility: WHO.* https://www.who.int/news/item/04-04-2023-1-in-6-people-globally-affected-by-infertility#:~:text=Around%2017.5%25%20of%20the%20adult,care%20for%20those%20in%20need
5. Martinez, G., & Daniels, K. (2023). *Fertility of Men and Women Aged 15–49 in the United States: National Survey of Family Growth, 2015–2019.* (National Health Statistics Reports No. 179). U.S. Department of Health and Human Services, National Center for Health Statistics. https://www.cdc.gov/nchs/data/nhsr/nhsr179.pdf
6. Mayo Clinic. (2022, September 28). *Women's Health Women's Life Stages.* Mayo Foundation for Medical Education and Research. https://www.mayoclinic.org/healthy-lifestyle/womens-health/basics/womens-life-stages/hlv-20049411
7. McLean Hospital. (2022, March 4). *Understanding Mental Health Over a Woman's Lifetime.* Mass General Brigham. https://www.mcleanhospital.org/essential/understanding-mental-health-over-womans-lifetime
8. U.S. Department of Health and Human Services. (n.d.). *NIH policy on sex as a biological variable.* National Institutes of Health-Office of Research on Women's Health. https://orwh.od.nih.gov/sex-gender/orwh-mission-area-sex-gender-in-research/nih-policy-on-sex-as-biological-variable
9. Mayo Clinic. (2022, December 6). *Female fertility: Why lifestyle choices count.* Mayo Foundation for Medical Education and Research. https://www.mayoclinic.org/healthy-lifestyle/getting-pregnant/in-depth/female-fertility/art-20045887
10. *Fertility statistics.* Extend Fertility. (2019, September 9). https://extendfertility.com/your-fertility/fertility-statistics-by-age/
11. *Fertility and age.* Extend Fertility (2019, September 9). https://extendfertility.com/your-fertility-3/fertility-and-age
12. U.S. Department of Health and Human Services. (2021, November 18). *Men's Reproductive Health.* Eunice Kennedy Shriver National Institute of Child Health and Human Development. https://www.nichd.nih.gov/health/topics/menshealth
13. American College of Obstetricians and Gynecologists. (2022). *Female Age-Related Fertility Decline.* https://www.acog.org/clinical/clinical-guidance/committee-opinion/articles/2014/03/female-age-related-fertility-decline
14. Centers for Disease Control and Prevention. (2024, January 8). *ART success rates.* https://www.cdc.gov/art/artdata/index.html
15. American College of Obstetricians and Gynecologists. (2021). *Importance of Social Determinants of Health and Cultural Awareness in the Delivery of Reproductive Health Care.* https://www.acog.org/clinical/clinical-guidance/committee-opinion/articles/2018/01/importance-of-social-determinants-of-health-and-cultural-awareness-in-the-delivery-of-reproductive-health-care

Get to know us.

Risk Strategies Consulting is comprised of experienced consultants, actuaries, data scientists, auditors, pharmacists, accountants, and other experts able to help payers, providers, and plan sponsors clearly understand the risks of their business and ways to minimize and manage them.

As a national consulting and actuarial services business, Risk Strategies Consulting provides high-touch consulting and state-of-the-art analytics services including strategy and consulting (encompassing health and welfare with deep pharmacy expertise, as well as mergers and acquisitions); actuarial services for plan sponsors, providers, and insurers; and benefit and claim audit services. Services are provided for a wide variety of industry segments including government entities, manufacturing and distribution, and self-funded organizations including corporations and trusts, healthcare organizations, national and regional insurance companies, and private equity firms, among others.

Learn more.

Visit us at risk-strategies.com/consulting

