

The economy of the future is in women's health

Short communication

I was asked to help prepare panels for the Fifth Vivian Pinn Symposium sponsored by NIH, and in doing so, my mind was stirred by the underinvestment in women's health companies, technology breakthroughs for women's issues, and sex differences in life science research and development efforts. I was shocked to learn, for example, that in preclinical studies, scientist overwhelmingly use male mice because the menstrual cycle of female mice might give different results! Women were only added as participants in clinical trials after 1994, and that was not voluntary but mandated by the government. Despite the mandate, the inclusion of women and people of color in clinical trials is still not universally adopted. There is an ingrained fear of interfering with fertility. There is an unconscious bias in science against the data collected from mammals that have estrogen and progesterone. Bias in science leads to products that do not serve the total population. Women are not small men.

Why is this so, and what does this say about 50% of the population who would use life science products and who are making 80% of the buying decisions for their families in healthcare? The same bias exists when looking at investments in women's healthcare companies. Both underinvestment in technologies/products that provide real value to women as well as preventing female subjects to participate in clinical trials help fuel this bias.

Very few women CEOs can find venture financing or expansion capital. An increased focus on sex-and-gender R&D could lead to interventions for women, which in turn, will lead to better health for all and increased productivity of subsequent generations that can catalyze a cycle of positive societal development.

Venture capital funds have historically not invested in companies that focus on sex and gender or women's health. There is an unconscious bias that these companies do not make money or have issues with getting reimbursement from Medicare and insurance providers. Products that serve women's sexual needs are considered "vice" ventures and do not attract traditional venture capital. As an investor for over 30 years in life sciences companies, I have observed that women CEOs and women's healthcare companies are generally considered a higher risk for most venture funds.

The rise of femtech funds

This lack of venture funding is being augmented by Femtech Funds, which focus on women's health and needs. Portfolia was the first to launch a Femtech fund in 2018 as an angel venture investment model. Portfolia is an investing community of high-net worth women from around the world investing for returns and impact. Other angel funds are sprouting up in many parts of the U.S., such as Astia, Avestria, Steel Sky, Octopus Ventures, Essity Ventures, Adjuvant Capital, Real Ventures, and Golden Seeds. Small beginnings, but important, these funds are training women to be comfortable investing in venture capital with the idea that women who have capital can use it to support entrepreneurs in women's healthcare. The market in Femtech revenue in 2019 was over \$600 million and is expected to reach \$1.10 billion by 2024 according to Frost and Sullivan. Considering this potential, the overall investment is quite low at this moment.

As a lead investor in Portfolia's Femtech Funds I participate actively in the transfer of venture capital knowledge to our investors,

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and we back men and women management teams that fit the model of high impact and return. The investment model is to learn by doing and feeling what "venture" is by using your own money and getting the reward both financially and from the products that come to market. I was mentored early in my career by some great venture capitalists, and that mentoring is used now for new women investors. There is power and purpose in having skin in the game when you want to see change in investment focus and balance the proportion of investments in women's health and wellness.

Ample opportunity for growth

Women's health growth opportunities abound across a woman's lifespan. These newer ideas and technologies could meaningfully improve the quality of life for women, lower the cost of healthcare for women, and offer an excellent financial return. Currently, there is a focus on reproductive solutions for fertility and menstrual care. However, women-prevalent diseases or conditions such as Lupus, Alzheimer's, thyroid cancers, and menopause, as well as mental health disorders, are persistently underserved. So, too, are solutions for early detection of endometrial, uterine, and ovarian cancers along with heart disease and pain management, which present differently in women than in men. There is ample opportunity for growth, and economic return.

This is not to say that the focus should only be on women. Male allyship is needed for the culture change and paradigm shift to promote the integration of sex and gender consideration in biomedical research and the development of commercial products. Allyship is a term which has been described in *Forbes* magazine as the key to unlocking diversity by working with people who actively promote and aspire to advance the culture of inclusion through intentional, positive, and conscious efforts. From reviewers for grants and publications to venture backing of startups, the need for a women's eye is important now. The stigma of menstruation needs to be removed.

Driving innovation

Male mentors and investors have been instrumental in my career, which included the founding of Sequenom as the CEO. We need all people to propel the shift into inclusion and equality. I believe that diversity of thought and inclusion will produce better economic and scientific outcomes in the future.

Public and private partnerships can be utilized for advancing science and innovation around sex and gender consideration. The maternal mortality crisis, the obesity epidemic, as well as the issues surrounding mental health and the opioid crisis are examples of areas that could benefit from integrating sex and gender into biomedical research. The economic opportunity to solve these problems is huge.

Biomedical research that includes sex and gender builds trust for patients and advocates. The higher healthcare costs in the U.S. due to many contextual factors, such as health policies, has not translated to better care or outcomes as it relates to women's health. We will drive innovation with sex and gender — specific diagnostics, treatments, devices, and/or therapies and create a better economic outcome for investors and patients.

We also can — and should — save money on clinical trials with the inclusion of women across their lifespan and by using female animals in the preclinical studies. Unfortunately, the failure rate for clinical trials is high, and products have been removed from the market due to adverse effects on women. If more women were included in all phases of a clinical trial, there is the potential to evaluate sex and gender differences in efficacy and safety that could save money and time in the long run.

One of Portfolia's recent investments was in Maven, a telehealth network delivering on-demand access to virtual care and services,

built specifically for women and families. The company is focused on advancing women's health, family planning, and diversity in the workforce by empowering parents to plan or start a family while growing their careers. Employers that have used the company's services have found they are able to lower their healthcare costs while improving their ability to attract and retain women and working parents. So far, the company has raised over \$88 million in venture capital.

The time has come to put women's health and wellness at the top of the investment and science research lists, or at least equal with other opportunities, because to do so not only affords investors the opportunity to make meaningful returns, but also because the positive impact such investments will make on society in general.

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We have no conflict of interest in this article.

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