



WHITE PAPER

**using digital
tools to drive
healthier behaviors
& outcomes**

How Ovia Health drives changes in behavior that lead to better maternal health outcomes and a decrease in healthcare spend

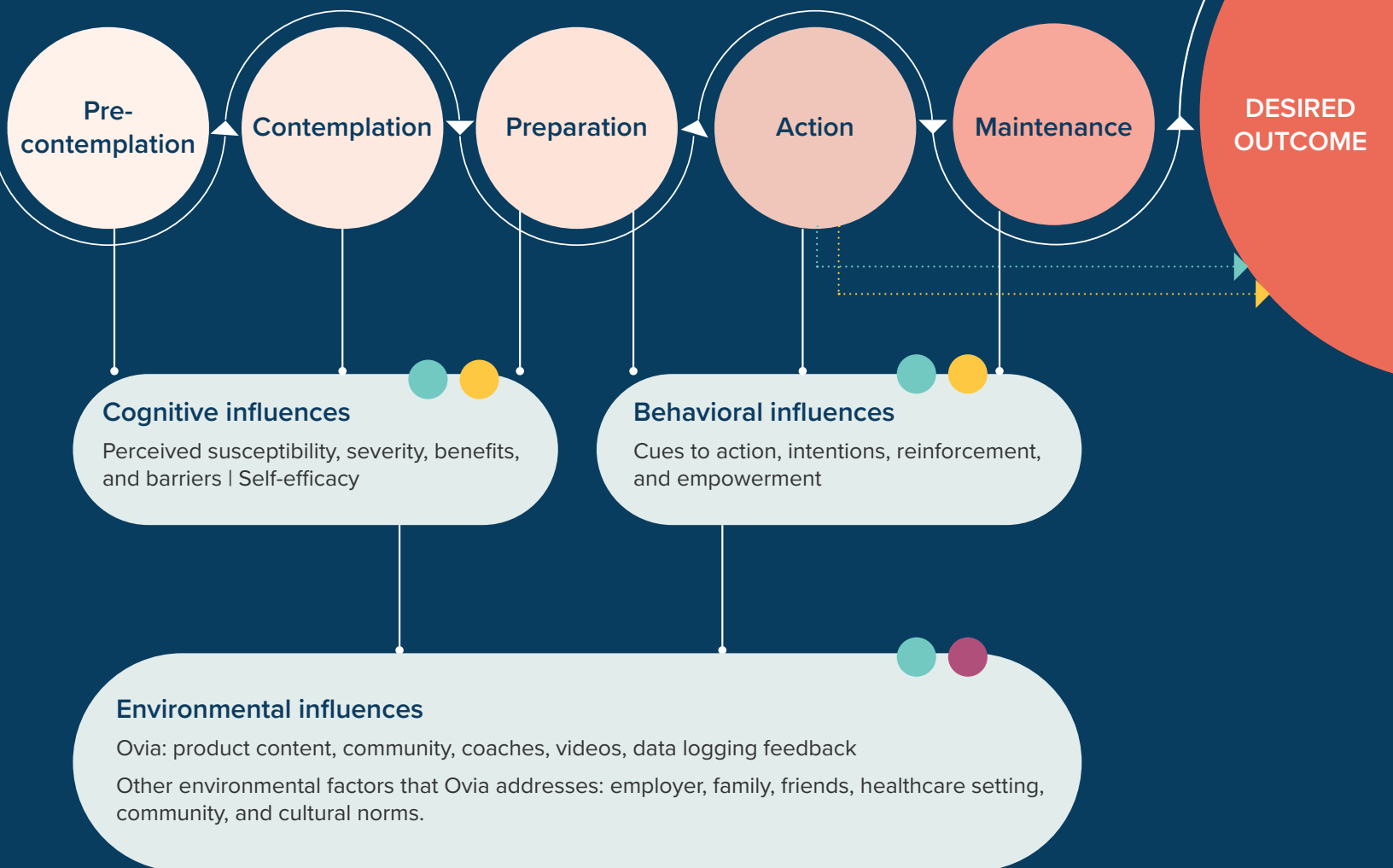
Empowering an individual to change their behavior to achieve a desirable health outcome is not always straightforward, especially if the behavior feels daunting and the outcome seems distant. However, behavior change theories have been successful in driving optimal outcomes and decreasing healthcare spend when used in interventions targeting pregnant people.¹ Ovia Health delivers carefully curated programs that take into account personal health conditions and preferences in order to educate and empower members.

Evidence-based theories of behavior change, namely, the Health Belief Model (HBM), Social Cognitive Theory (SCT), and Transtheoretical Model (TTM), serve as the foundation of Ovia Health's Behavior Change Framework which inform all of our personalized clinical programs. Using this integrated framework, Ovia Health empowers members to make decisions and engage in behaviors that lead to improved health outcomes and reduced healthcare costs.

This combined framework allows Ovia Health to address three key behavior change domains:

- 1** Self-advocacy and plan-development skills
- 2** Healthcare decision making
- 3** Habit creation and care adherence

Ovia Health's behavior change framework



- **SCT: Social Cognitive Theory**
- **HBM: Health Belief Model**
- **TTM: Transtheoretical Model**

1

Self-advocacy and plan-development skills

Social Cognitive Theory: addressing self-advocacy and plan-development skills

SCT considers the interaction between personal cognitive factors, social interactions and environmental conditions, and behavior engagement — developed by Albert Bandura in the 1960s.² SCT has been shown to work successfully in interventions where patient skill development is necessary for success.^{3, 4, 5, 6, 7, 8}

Ovia Health employs SCT to help members develop self-advocacy and plan-development skills. These skills allow members to successfully convey concerns, opinions, and desires to healthcare providers, employers, and colleagues, ultimately leading to improved health outcomes and reduced healthcare spend.

Desired Outcomes	Targeted Behavior(s)
Fewer preterm births	Advocate for a cervical length measurement from their health-care provider. Discuss a progesterone prescription with their healthcare provider, if applicable.
Early identification of postpartum depression (PPD)	Complete the Edinburgh Postnatal Depression Scale screener in the app. Discuss mental health status with their healthcare provider. Advocate for effective mental health treatment, if applicable.
Improved return-to-work and employee retention rates	Develop a return to work plan with their manager before delivery and maternity leave.
Increased breastfeeding rates	Develop a plan for breastfeeding during parental leave and after returning to work.
Child and adult vaccination	Provide members with information about recommended vaccines for their chapter of life so they understand the science of vaccines, and can make an informed decision about vaccination at their upcoming provider visit.

How Ovia Health uses SCT

Receiving a cervical length measurement → fewer preterm births

Preterm delivery affects about 1 in 10 pregnancies in the United States; however, the cause of up to ⅔ of all preterm deliveries is unknown. Despite there being an enormous gap in fully understanding all the causes of preterm birth (and how to prevent them), one intervention has been shown to help reduce the risk of preterm birth: progesterone. Progesterone has been shown to successfully help people with short cervixes or a history of preterm delivery (PTD) carry to term, however, less than half of people eligible for this therapy receive a prescription.⁹ Ovia improves awareness and knowledge about the risks of PTD, as well as potential routes to avoidance, such as cervical length measurement and progesterone prescription. Content is delivered to members based on gestational age and personal health factors, identified through the Health Assessment.

The delivery of tailored content increases members' perceived connection and perceived risk of PTD and encourages them to begin thinking about ways to mitigate risk.

After engagement with Ovia's preterm prevention program, Ovia members were 2x more likely to have their cervical length measured and were more likely to be prescribed progesterone than non-members ($p < 0.05$.)

Ovia provides strategies for PTD risk reduction by informing members of the various risk factors and associated strategies for mitigating risk. Articles such as, "What are the main risk factors for preterm birth?" effectively inform members to identify personal risk factors and prompt contemplation about how to avoid PTD. This platform allows members to share their own concerns, experiences, and successes. Personalized coaching messages are sent to Ovia members encouraging them to direct questions about cervical length measurement to the Ovia Care Team or to their healthcare providers.

Ovia helps members develop the skills necessary to have a successful conversation with their provider about cervical length measurement. Articles such as, "Will my healthcare provider measure my cervical length?" effectively prepare members to self-advocate when interacting with their provider. Reading examples of how these conversations typically happen and strategies they can use in the doctor's office helps members address barriers and set intentions about the outcome of the conversation (i.e., "the conversation will end with my provider understanding my concerns and agreeing to perform a cervical length measurement"). Ovia's Care Team is there to support and reassure members, answer questions, and help build confidence. Prompts are sent to members at the time during pregnancy when members should be asking their providers for cervical length measurements. This ensures that the topic is top of mind during prenatal visits.

Encouraging a member to receive a cervical length measurement is a tiny lever a member can control to ultimately reduce the risk of preterm birth.

2x more

Ovia members were 2x more likely to have their cervical length measured and were more likely to be prescribed progesterone²



54%
reduction
in preterm birth rates

In a randomized control study of 10,000 Ovia members, researchers found that Ovia members who interacted with Ovia's preterm birth prevention program saw a 54% reduction in preterm birth rates.

Those who engaged with the full program, which included clinical education, dynamic health prompts, and 365 access to a Care Team of licensed health clinicians and specialists saw an even higher preterm birth reduction rate — of 68%.

2

healthcare decision making

Health Belief Model (HBM): addressing healthcare decision making

HBM uses messaging techniques to target perceived barriers and benefits, self efficacy, and risk in order to incite behavior change.¹⁰ HBM is most successful in interventions intended to motivate members to engage in one-time behaviors.^{11, 12, 13, 14}

Ovia Health applies the HBM framework to develop a comprehensive methodology for encouraging members to make decisions about their healthcare that have been shown to lead to optimal health outcomes and reduce healthcare spend.

Desired Outcomes	Targeted Behavior(s)
Fewer medically unnecessary Cesareans	Selecting a certified nurse midwife as a primary provider if clinically appropriate, or as a part of a member's care team.
	Selection of a delivery hospital with a low Cesarean rate.

How Ovia Health uses HBM



One in three women in the U.S. deliver via Cesarean, but according to the World Health Organization, the number should really be somewhere between 1 in 7 or even 1 in 10.^{17, 18}

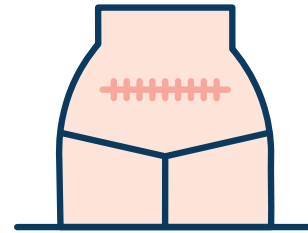
Beyond personal health factors, the Cesarean rate of a delivery hospital is the most influential determinant of how a person will deliver their baby in the United States.^{15, 16}

Oftentimes, people are unaware of the negative health outcomes associated with unnecessary Cesareans. It has been shown that people tend to ignore quality metrics when choosing their delivery hospital and do not agree that quality indicators are always indicative of the care they will personally receive.²⁰ In light of these findings, Ovia emphasizes the association between hospital or facility quality metrics and method of delivery.

Ovia has created a robust, clinically-validated education module to inform members about the risks of medically unnecessary Cesareans, benefits of vaginal delivery, and factors that can influence likelihood of delivering via Cesarean.

Unlike some Ovia modules that enroll based on risk factors collected through the Health Assessment, every woman is enrolled in Ovia's Delivery Decisions module, due to the nearly universal risk of Cesarean section. Ovia uses this clinical module to normalize the topic of delivery methods and to increase perceived susceptibility and severity of unnecessary Cesareans.

Quality information about a hospital such as its Cesarean section rate can be complicated to track down and sort through, so Ovia Care Advocates do the legwork for members by taking into account a member's personal provider preferences such as gender, language, and race, insurance network, and distance to home, and combine these with hospital quality metrics to make personalized hospital recommendations informed by members' unique needs.



After engaging with Ovia Health's clinical module, **63% of Ovia members agree that having a medically unnecessary Cesarean is a serious problem.**



Across Ovia's Book of Business, we observe a 34% reduction in Cesarean section rates.

Each member is made to understand the risks associated with her own pregnancy and their own choices about their healthcare. Ovia then provides tangible steps and tools to mitigate those risks.

Ovia Health members scored **34% higher (86%)** than non-Ovia members (**52%**) on in-app assessments about method of delivery, associated risk factors, and strategies for avoiding an unnecessary Cesarean ($p < 0.001$).

helping members deliver safely

Members are proactively contacted by Ovia's Care Team throughout the decision-making process to discuss their birth plan and provider selection. They're also messaged afterward, to ensure they are receiving all the support and encouragement they need.

Care Team messages and prompts are delivered to remind members to do their research, make an appointment, and discuss their birth plan with their provider. Care Team messages and prompts serve as cues to action because they are delivered to the top of a member's timeline, where they spends the bulk of their time in the solution.

As a result, 76% of Ovia members communicate a preference for vaginal delivery to their healthcare provider.



3

self advocacy & plan development skills

Transtheoretical Model (TTM): addressing habit creation and care adherence

The Transtheoretical Model, or Stages of Change theory, utilizes a series of unique stages to move people through behavior change toward a desired outcome.²¹ TTM has been shown to be most successful at addressing behaviors that are intended to become routine, habitual practices.^{22, 23}

Ovia Health uses TTM to inform the way members adopt and adhere to recurring behaviors.

Desired Outcomes	Targeted Behavior(s)
Reduced reliance on fertility treatments	Frequent data logging with Ovia Fertility in order to enhance cycle predictions and improve identification of the fertile window and ovulation, to increase the chances of conceiving on one's own.
Reducing rates of preeclampsia	Understand personal risk for developing hypertensive disorders like preeclampsia Understand how low-dose aspirin can reduce the risk of preeclampsia Discuss a low-dose aspirin regimen with their provider Adhere to low-dose aspirin daily regimen
Treating perinatal mood and anxiety disorders, like postpartum depression	Understand personal risk for developing PMAD's like PPD Understand how medication like SSRI's and therapy can effectively treat PPD Discuss medication for PPD with provider, if necessary Adhere to medication regimen

How Ovia Health uses TTM

When a member downloads an Ovia Health product, they are immediately delivered content that increases awareness of conditions and propels her towards considering a behavior change. For instance, members who are trying to conceive using Ovia Fertility are made aware of the importance of data logging in order to allow the algorithm to accurately predict the fertile window and date of ovulation — time points that are necessary for timing intercourse for successful conception.²⁴ This helps members conceive successfully on their own without intervention from assisted reproductive technology (ART) like IUI and IVF, which is expensive and risky. Pregnancies achieved through ART are inherently at higher risk of twins, triplets or high-order multiples, with accompanying risk for premature birth, high blood pressure, placenta abnormalities and other challenges. By helping members conceive without ART, Ovia not only avoids cost during the fertility stage, but also down the line throughout pregnancy and postpartum.

Ovia sends introduction articles to all Ovia Fertility members showing them how to use the product and explaining why logging data is so important to their experience with the program. As members log data, Ovia shifts fertile window projections accordingly, and sends alerts about when ovulation is expected to occur. This immediate feedback mechanism provides positive reinforcement and encourages members to remain engaged so they will continue logging data.

Once members have been informed about the necessity of continuous data logging, they need to evaluate what adherence to this new behavior is worth to them. Ovia provides information about associated benefits of conceiving on one’s own without unnecessary ART intervention, as well as stories about other member’s experiences to facilitate this evaluation.

Ovia Fertility members log an average of 19 data points per month, meaning members track details about their cycles more than once a day.



Ovia’s Care Team functions as a caring, helpful, and trustworthy resource for members throughout their journey and are available to converse with members, encourage continuation, and troubleshoot obstacles.

The product itself is also a support system. The Ovia Community provides an additional layer of support to members who are trying to maintain this continuous behavior. Ovia delivers “Ovations” when members engage in positive behaviors, such as logging specific data points. **This incentive tool creates a positive-feedback loop that encourages members to maintain involvement in their behavior change journey.**



User engages in positive behavior

User receives personalized feedback + praise

Consistent positive behavior develops into a habit



**30%
reduction**

in assisted reproductive
technology

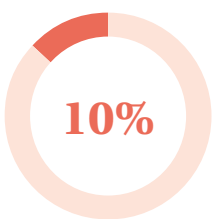
In order to stimulate and maintain members' confidence in their abilities to continue logging data — even in the face of delayed conception — Ovia shares informational articles and tips, and also sends reminders through coaching messages and prompts. This continuous support network allows members to maintain a recurring behavior for an extended period of time, without giving up or seeking alternate, hasty (and often expensive) options (i.e., assisted reproductive therapies).

Across our book of business, we observe a 30% reduction in assisted reproductive technology (ART) procedures.

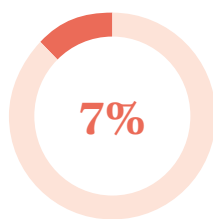
the proof is in the numbers

Ovia Health's interventions are rooted in evidence-based behavior change theories and constructs. The combination of awareness raising, education, support, skill development, as well as continued engagement and immediate feedback mechanisms has improved health outcomes for thousands of Ovia Health members.

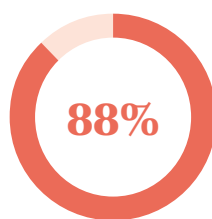
Ovia's interventions work together to improve outcomes. By increasing the number of pregnancies achieved on one's own (and increasing the number of women who seek cervical length measurement and receive progesterone prescriptions), Ovia directly influences the number of women who can avoid a dangerous and costly preterm delivery.



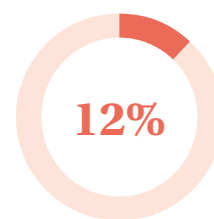
**US National
Average**



Ovia Health



**Vaginal
Delivery**



C-section

Compared to the United States national average of nearly 10%,²⁵ only 7% of Ovia Health members deliver preterm.

When asked during their third trimester, 88% of Ovia Health members plan for a vaginal delivery, while only 12% plan to deliver via C-section. This is compared to a 32% national Cesarean rate.²⁸



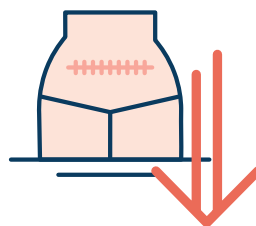
**\$68,000
preterm delivery**



**\$12,520
full term delivery**

Each preterm delivery costs about \$68,000²⁶ compared to an average of \$12,520 paid for full term, vaginal deliveries.²⁷

Ovia drives these outcomes by educating members about the risks associated with unnecessary Cesareans and the benefits of vaginal delivery, as well as the role of hospital quality metrics, and how to use data to inform decision making. On average, a Cesarean delivery costs about \$10,000 more than a vaginal delivery.²⁹



Reducing the number of people delivering via Cesarean can directly reduce healthcare spend for employers.



30% of members

conceive using the
Ovia solution

Of members who meet the criteria for infertility (trying to conceive unsuccessfully for more than 12 months under the age of 35, or more than 6 months for women over the age of 35), 30% successfully conceive using the Ovia solution.

Maximizing the potential of the Ovia algorithm by encouraging continuous menstrual cycle monitoring and data logging allows members with a history of difficulty conceiving to avoid expensive infertility treatments. For example, an 18-month period of infertility treatments costs over \$15,000.³⁰ That estimate doesn't even take into account the additional expense of absenteeism during treatment and the costs associated with multiples, which is often the result of infertility treatments.³²



An average of 33 hours of productivity are lost for every round of treatment.³¹

Ovia Health's ability to reduce dependence on infertility treatments and avoid associated conditions and expenses leads to direct cost savings for members and employers.

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