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Femtechnodystopia

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Reproductive rights, as we have long understood them, are dead. But at the same time that history seems to be moving backward, technology moves relentlessly forward. Femtech products, a category of consumer technology addressing an array of "female" health needs, seem poised to fill gaps created by states and stakeholders eager to limit birth control and abortion access and increase pregnancy surveillance and fetal rights. Period and fertility tracking applications could supplement or replace other contraception. Early digital alerts to missed periods can improve the chances of obtaining a legal abortion in states with ever-shrinking windows of availability or prompt behavioral changes that support the health of the fetus. However, more nefarious actors also have interests in these technologies and the intimate information they contain. In the wrong hands, these tools can effectuate increased reproductive control and criminalization. What happens next will depend on whether we can improve efficacy, limit foreseeable privacy risks, and raise consumer awareness. But the current legal and regulatory landscape makes achieving these goals far from a straightforward proposition, further complicated by political influence and a conservative Supreme Court. Thus, this Article concludes with multiple solutions involving diverse stakeholders, offering that a multifaceted approach is needed to keep femtech's dystopian future from becoming a reality.

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INTRODUCTION

Dobbs v. Jackson Women's Health Organization[1] did exactly what many now-Supreme Court Justices swore could never happen—it sent the issue of abortion back to the states.[2] But while the law takes reproductive rights back to the status quo before the landmark *Roe v. Wade* decision in 1973,[3] consumer technology moves those rights—and

[1] 142 S.Ct. 2228 (2022).

[2] Becky Sullivan, *What conservative justices said—and didn't say—about* Roe *at their confirmations*, NPR (May 3, 2022) https://www.npr.org/2022/05/03/1096108319/roe-v-wade-alito-conservative-justices-confirmation-hearings.

[3] 410 U.S. 113 (1973).

a previously unimaginable surveillance apparatus[4]—relentlessly into the future. One such technology is femtech,[5] a catch-all term for products targeting "female"[6] health, particularly smartphone-based applications (apps) for period and fertility tracking.[7] However, in light of *Dobbs,* the future these technologies will create remains to be seen.

Viewed optimistically, these digital tools could offset some of the most drastic restrictions on reproductive freedoms. Consumers can use functionalities that predict fertile days as a form of fertility-awareness-based contraception, which can soften the impact of limitations or outright prohibitions on access to other birth control. Apps can also alert users to pregnancy early—as soon as a period is late. This feature allows consumers more time to terminate a very early pregnancy in states where the window to obtain a legal abortion is short.[8] And in places where abortion is unavailable, early notification allows more time to plan—both financially and logistically—to travel for needed care. As a result, in a world with ever-shrinking access to abortion and birth control, period and fertility tracking apps may conveniently and discreetly increase users' agency over their reproductive health.[9]

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[4] Albert Fox Cahn and Eleni Manis, Surveillance Technology Oversight Project, *The Handmaid's Trail: Abortion Surveillance After* Roe (May 24, 2022) https://www.stopspying.org/handmaids-trail.

[5] The Rise of a New Category: Femtech, CLUE (Sept. 15, 2016). https://helloclue.com/articles/culture/rise-new-category-femtech; This term could also include apps that allow consumers to access hormonal birth control or the "abortion pill" mifepristone and misoprostol). However, those products are outside the scope of this paper.

[6] The "Fem" in "Femtech" is from the word female, though this paper uses inclusive language wherever possible. The authors recognize that people who menstruate and are capable of becoming pregnant includes "women, transgender males, intersex persons, [non-]binary persons, and other persons who have the capacity for a menstrual cycle." Margaret E. Johnson, *Menstrual Justice*, 53 U.C. DAVIS L. REV. 1, 5 (2019). These groups also use digital menstrual trackers Gene Pinter, *ThemTech: Digital Menstrual Tracking Practices Among Transgender, Non-Binary and Gender Diverse Users,* (November 2020).

[7] Some scholars distinguish between fertility trackers and period trackers, asserting that the former is intended to achieve pregnancy and the latter is not. Sarah E. Fox, Amanda Menkin, Jordan Eschler, and Uba Backonja, *Multiples Over Models: Interrogating the Past and Collectively Reimagining the Future of Menstrual Sensemaking,* ACM Transactions on Computer-Human Interaction 27(4), Article 22 at Page 9 (2020). However, as we discuss in this Article, we believe that to be a distinction without a difference for most consumers and intentionally discuss these technologies as a singular category.

[8] For example, Texas's initial law prevented abortion after six weeks of gestation, which is only two weeks after a missed period. S.B. 8, 87th Leg., Reg. Sess. (Tex. 2021) (S.B. 8) (codified at Tex. Health & Safety Code §§ 171.203(b), 171.204(a)). Abortion is completely banned in Texas on the 30th day after "issuance of a United States Supreme Court judgment in a decision overruling, wholly or partly, *Roe v. Wade*, 410 U.S. 113 (1973), as modified by *Planned Parenthood v. Casey*, 505 U.S. 833 (1992), thereby allowing the states of the United States to prohibit abortion." H.B. 1280, 87th Leg., Reg. Session (Tex. 2021).

[9] Molly McHugh, *Does Femtech Give Users Control of Their Health or Take it Away?* THE RINGER (March 18, 2019, 6:30AM EDT) available at https://www.theringer.com/tech/2019/3/18/18267094/femtech-female-health-apps-menstruation-fertility-trackers-clue-glow-ava.

However, this moment in history warrants healthy pessimism. People of reproductive potential will not be the only actors interested in these (and other) technologies and the intimate data they contain. Faith-based organizations[10] or conservative political administrations[11] may wish to further their ideological beliefs by engaging directly with femtech products to promote fertility-awareness-based methods of contraception over other hormonal and barrier options. Anti-abortion-minded individuals or groups may also target advertisements promoting their agenda based on user data[12] or even develop or fund apps.[13] Federal and state actors prohibiting abortions after a certain length of gestation may be interested in the specific date of a user's last menstrual period.[14] Citizens could leverage consumer data to avail themselves of the bounties offered by recent state laws aimed at curtailing abortion access through private enforcement.[15] And in a future with increased criminalization of fetal-harming behaviors or even recognition of fetal personhood,[16] data about alcohol and other substance use—and even diet, exercise, and other activities—may be leveraged in legal actions. In light of this new reality, one of the most promising tools to counteract the assault on reproductive rights also has the potential to become one of its greatest weapons.

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[10] Lilah Burke, *Catholic Contraception? Get the App,* INSIDE HIGHER ED (January 24, 2020) https://www.insidehighered.com/news/2020/01/24/catholic-colleges-develop-apps-natural-family-planning.

[11] Kinsey Hasstedt, *A Domestic Gag Rule and More: The Trump Administration's Proposed Changes to Title X,* Health Affairs (June 18, 2018) https://www.healthaffairs.org/do/10.1377/forefront.20180614.838675/full/ (describing proposed rulemaking that imposes a departure from prior definitions of "family planning" to emphasize "fertility awareness-based methods, and specifically natural family planning"); Brian Beutler, *Leaked Memo Reveals White House Wish List,* Crooked (October 19, 2017) https://crooked.com/articles/leaked-memo-reveals-white-house-wish-list/ (describing a leaked memo in which the Trump Administration expressed a desire to halve federal funding for Title X and divert money into programs that promote "fertility awareness" as a method of birth control.).

[12] In re Copley Advertising, LLC, No. 1784CV01033 (Mass. Super. Ct. Apr. 4, 2017).

[13] Eva Wiseman, *Beware the Fertility App That Wants to Share Your Data With Anti-Abortion Campaigners,* THE GUARDIAN (June 9, 2019) https://www.theguardian.com/lifeandstyle/2019/jun/09/app-creep-and-the-dark-side-of-sharing-private-date-on-our-phones (describing the case of *Femm* – an app "bankrolled by a hedge-funder who campaigns against abortion and birth control"); Sarah E. Fox, Amanda Menkin, Jordan Eschler, and Uba Backonja, *Multiples Over Models: Interrogating the Past and Collectively Reimagining the Future of Menstrual Sensemaking,* ACM Transactions on Computer-Human Interaction 27(4), Article 22 at 7-8 (Describing Femm as "backed by conservative anti-choice foundation "chiaroscuro" and that it was "said to have shared misleading and inaccurate information with users regarding the side effects of hormonal birth control.").

[14] *See infra* notes 197-98 and accompanying text.

[15] *See e.g.,* S.B. 8, 87th Leg., Reg. Sess. (Tex. 2021) (S.B. 8) (codified at Tex. Health & Safety Code §§ 171.203(b), 171.204(a)).

[16] *See e.g.,* S.B. 1457, 55th Leg., 1st Reg. Sess. (Ariz. 2021) (codified at Ariz. Rev. Stat. § 1-219A). Currently being challenged in Isaacson v. Brnovich; *See also* H.B. 704, 134th Gen. Assem. (Ohio 2021-2022).

As with all restrictions on freedoms, the worst possible outcomes are not evenly distributed. The populations most burdened by limitations on abortion and birth control are the same ones harmed by systemic racism. Those arrested for behaviors during pregnancy are more likely people of color, especially in the South.[17] And, independent of race, they are more likely to be poor.[18] Alarming pregnancy outcomes, including horrific maternal mortality rates,[19] follow these trends and mirror concerning data about lower technology literacy.[20]

All period and fertility tracking apps expose consumers to risks, but not all apps are regulated the same way. The Food and Drug Administration (FDA) distinguishes between contraceptive and proceptive apps. As a result, most apps do not need to demonstrate safety or accuracy or include specific labeling before entering the market. Further, not all apps disclose efficacy and privacy information, nor does the law generally require them to do so. Worse, the data these apps contain are not entitled to the same privacy and security protections as other health-related data and are routinely sold to third parties, vulnerable to hacking, and shared with law enforcement. But obvious regulatory and legal solutions are insufficient and unlikely in the current political landscape. In the context of this reality, the future of period and fertility tracking apps is, at best, uncertain.

This Article proceeds in three parts. Part I considers what the *Dobbs* decision means for reproductive rights beyond abortion, ranging from access to contraception to pregnancy surveillance and control, and the potential for femtech innovation to offset the worst possible outcomes. But the same qualities that make these technologies so promising also make them dangerous. Part II identifies how these apps can worsen the assault on reproductive freedoms—especially in a world where a constitutional right to privacy may no longer exist, and the state's interest in potential life extends from menarche to menopause. More concerning still, as this Part explores, the regulatory and legal environment is poorly equipped to avoid the worst possible outcomes and may even exacerbate the problems these femtech tools can create.

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[17] Lynn M. Paltrow and Jeanne Flavin, *Arrests of and Forced Interventions on Pregnant Women in the United States,* 1973-2005: Implications for Women's Legal Status and Public Health, 38 J. HEALTH POLITICS, POL'Y AND L. 299, 311 (2013) ("Of the 368 women for whom information on race was available, 59 percent were women of color, including African Americans, Hispanic American/Latinas, Native Americans, and Asian/Pacific Islanders; 52 percent were African American. African American women in particular are overrepresented in our study, but this is especially true in the South.").

[18] *Id.* (Noting that "71 percent qualified for indigent defense.").

[19] Khiara M. Bridges, *Racial Disparities in Maternal Mortality*, 95 N.Y.U.L. Rev. 1229 (2020).

[20] Saida Mamedova, Emily Pawlowski, *A Description of U.S. Adults Who Are Not Digitally Literate,* Stats in Brief (May 2018) https://nces.ed.gov/pubs2018/2018161.pdf.

No serious policy proposal can involve asking everyone capable of becoming pregnant to opt-out of the digital economy entirely or simply give up technologies they want to use. Such a position is not only unrealistic, but it also shifts responsibility onto individuals and could exacerbate disparities by preventing those most in need from accruing any potential benefit from technological advancement. Millions of Americans find these apps beneficial. These consumers deserve high-quality products, not simply to be told to stop using and delete these—or any other—electronic tools. Thus, this Article offers that three key criteria must be satisfied to realize the promise of period and fertility tracking apps and avoid the greatest perils. Apps must be effective, the data they contain must be kept private and secure, and consumers must be aware of risks and limitations. But solutions to these problems are complicated by developer conflicts of interest and a reproductive surveillance state with criminal implications. With this in mind, Part III offers multiple options that account for practical limitations, a sober assessment of the current Supreme Court, and political trends. In it, we turn away from exclusive reliance on government intervention and look to private industry and individual actions. Our Article concludes with a warning: We must act now—with all available tools—to prevent femtech's dystopian future from becoming a reality.

I. FEMTECH IN THE SHADOW OF *DOBBS*

Since the Court decided *Roe v. Wade*, conservative lawmakers, religious groups, and other anti-choice activists have been hard at work anticipating and hastening its demise.[21] With the Court's decision in *Dobbs,* they have finally achieved their goal of reducing or outright eliminating access to safe and legal abortions in many parts of the United States. But this long sought-after accomplishment is not the end. This Part looks at what comes next in the continued efforts to curtail reproductive freedoms. It then turns to period and fertility trackers as a promising potential solution that, if designed well, offers free, discreet, and convenient tools to increase bodily autonomy at the same time public and private entities would seek to restrict it.

A. The End of Reproductive Rights

In the *Dobbs* opinion overturning *Roe* and *Casey*, the majority goes to great lengths to suggest this is a narrow ruling with little impact

[21] Jesus Jimenez, *What is a Trigger Law? And Which States Have Them?* THE NEW YORK TIMES (May 4, 2022) https://www.nytimes.com/2022/05/04/us/abortion-trigger-laws.html.

other than returning the question of abortion to the states.[22] But regardless of whether this is genuine—and we believe it is not—the opinion itself and the legislative aftermath make clear this is not the end. States have already sought to restrict abortion as much as possible, with some removing exceptions for rape and incest and others already considering fetal personhood statutes. But with abortion's demise well underway, the Court's emphasis on the fetus and the state's interest in that fetus "at all stages of development" could give rise to a number of other challenges to reproductive rights.[23] This includes reduced access to or prohibitions on birth control and increased reproductive surveillance in the name of protecting fetal health and life.[24]

1. Access to Birth Control

A discussion of birth control in constitutional law reveals that we cannot discount concerns about restrictions or bans on contraception as unrealistic. Much like access to abortion before *Dobbs,* contraception appears to start off as settled law. In the 1965 case *Griswold v. Connecticut*, the Supreme Court held there was a constitutional right to privacy that incorporated within it the right of a married couple to determine whether to use contraception to prevent pregnancy.[25] Though the Constitution does not specifically mention the right to privacy or the right to contraception, the Court pointed out that the unenumerated parental right to raise children in a specific manner and the right to association have long been held as not only constitutional rights but ones of fundamental importance.[26] And, critically, the Court notes that enumerated rights would be less secure without these "peripheral rights."[27] Perhaps most important to current conversations of whether a constitutional right to privacy exists is the declaration in *Griswold* that the unenumerated status was less relevant considering

[22] Dobbs v. Jackson, 142 S.C.t 2228, 2261 (2022). Justice Thomas's concurrence raises considerable doubt about the sincerity of this claim. *Id.* at 2301 ("in future cases, we should reconsider all of the Court's substantive due process precedents, including *Griswold*, *Lawrence*, and *Obergefell*.").

[23] In its recounting of historical abortion regulations, the *Dobbs* opinion makes special note of the application to "all stages" at least thirteen times.

[24] A state interest in fetal health would be an expansion of previous state interest, which focused on the potential life of the fetus, and would open the door to surveillance and intervention during the pregnancy. *See* Michael R. Ulrich, *With Child, Without Rights? Restoring a Pregnant Woman's Right to Refuse Medical Treatment Through the HIV Lens*, 24 YALE J. L. FEMINISM 303, 328 (2012) (finding maternal-fetal jurisprudence does not establish or recognize a state interest in protecting the health of the fetus to overcome the woman's liberty interests).

[25] 381 U.S. 479 (1965).

[26] *Id.* at 482.

[27] *Id.* at 483.

the right to privacy was older than the Bill of Rights itself.[28] This line of thinking was central to the follow-up case, *Eisenstadt v. Baird*, where the Court made clear the right to privacy and the right to contraception it contained emanated not from the couple's marital status but as a preexisting Constitutional right for each individual.[29]

In light of this precedent, the step from revoking the right to abortion to revoking the right to contraception might seem like a leap. But reading these cases with new eyes after *Dobbs* reveals concerning vulnerabilities in the rights articulated in both *Griswold* and *Eisenstadt*. *Dobbs* questions the right to privacy generally and emphasizes the relevance of ongoing public debate, while contraception remains a contentious public and political issue.[30] *Dobbs* rejected several arguments for abortion that also apply to the core of a right to contraception. For example, the Court was unmoved by the claims that "people will be inhibited from exercising their freedom to choose the types of relationships they desire" or that "women will be unable to compete with men in the workplace and in other endeavors."[31] Notably, the arguments embraced in *Dobbs*[32] about why abortion rights are nonessential in the modern era can easily apply to contraception: attitudes about unmarried pregnant women have changed;[33] there are expanded federal and state laws banning discrimination based on

[28] *Id.* at 486. This line of reasoning played a critical role in the Court finding an individual right to firearms for the purpose of self-defense in *District of Columbia v. Heller*. 554 U.S. 570 (2008). There, in determining the existence and scope of the right the Court found it important that the Amendment was merely recognizing a pre-existing right. *Id.* at 592. Thus, the right to self-defense, while not explicitly mentioned in the Constitution, was "not a right granted by the Constitution. Neither is it in any manner dependent upon that instrument for its existence." *Id.*

[29] 405 U.S. 438, 453 (1972).

[30] *See* Dobbs, 142 S.Ct. at 2245 (discussing the relevance of differing public views and state legislatures efforts to restrict abortion rights); Senator Marsha Blackburn has explicitly criticized this case as "constitutionally unsound." Melissa Brown, *Sen. Marsha Blackburn criticizes 1965 Supreme Court ruling on birth control access,* Tennessean (March 21, 2022) https://www.tennessean.com/story/news/politics/2022/03/21/marsha-blackburn-criticizes-1965-supreme-court-ruling-birth-control/7120236001/.

[31] Dobbs, 142 S.Ct. at 2258.

[32] *Id.*

[33] *But see* Heidi Moseson, Moria Mahanaimy, Christine Dehlendorf, Caitlin Gerdts, *"…Society is, at the end of the day, still going to stigmatize you no matter which way": A qualitative study of the impact of stigma on social support during unintended pregnancy in early adulthood,* 14 PLOS ONE 1 (2019).

pregnancy;[34] there is increased leave for pregnancy and childbirth;[35] costs of health care for pregnancy are often covered by insurance or government assistance;[36] and safe haven laws allow people to drop off newborns without fear of criminalization.[37]

These are reasons enough to be suspicious about access to contraception in the post-*Dobbs* legal landscape, but the opinion highlights more cause for concern. *Dobbs* dismisses privacy and equal protection as justifications for the right to access abortion, leaving the Court to focus on the abortion right itself.[38] But unenumerated rights, according to the Court, must be "deeply rooted in [our] history and tradition" as an essential element to our Nation's "scheme of ordered liberty."[39] Under the current Court's perspective, contraception likely has no greater historical root than abortion.[40] And *Dobbs* emphasizes

[34] *But see,* Carly McCann and Donald Tomaskovic-Devey, *Pregnancy Discrimination at Work: An Analysis of Pregnancy Discrimination Charges Filed with the U.S. Equal Employment Opportunity Commission,* Center for Employment Equity (May 26, 2021) (finding that "despite an overall higher success rate of receiving benefits than other forms of sex discrimination, the majority (74%) of pregnancy charges result in no monetary benefit or required workplace change through EEOC process.").

[35] *But see,* Van Niel, Maureen Sayres, Richa Bhatia, and Nicholas S. Riano et. al. *The Impact of Paid Maternity Leave on the Mental and Physical Health of Mothers and Children: A Review of the literature and Policy Implications,* 28 HARVARD REV. OF PSYCHIATRY 112, 113 (2020) (noting that only 16% of all employed American workers have access to paid parental leave through their workplace" and that "as many as 23% of employed mothers return to work within ten days of giving birth, because of their inability to pay living expenses without income.").

[36] *But see* Michelle H. Moniz, A. Mark Fendrick, Giselle E. Kolenic, Anca Tilea, et. al., *Out-Of-Pocket Spending for Maternity Care Among Women With Employer-Based Insurance, (2008-15),* 39 HEALTH AFF. 1 (January 2020) (finding that that between 2008 and 2015, average out-of-pocket spending for maternity care rose among women with employer-based insurance).

[37] While theoretically available in all 50 states, and *sometimes* in *some circumstances* free from the threat of criminalization, infant safe havens are rarely used. According to the National Safe Haven Alliance's annual impact report, 115 babies were dropped off in 2021. This represents .00003143% of live births in that same year. National Safe Haven Alliance 2021 Impact Report; Centers for Disease Control and Prevention Vital Statistics Rapid Release, Births: Provisional Data for 2021(May 2022).

[38] The Court also rejected claims connecting abortion to rights of autonomy and defining one's concept of existence, which the Court could do the same for attempts to link a right to contraception to broader conceptual rights such as autonomy, equity, or justice. Dobbs, 142 S.Ct. at 2245. Despite a compelling brief arguing the Mississippi law violated the equal protection clause, the Court dispensed with equal protection in one paragraph stating that precedent foreclosed abortion restrictions as a sex-based restriction. *Id.* at 2245-46. *Contra* Brief for Equal Protection Constitutional Law Scholars Serena Mayeri, Melissa Murray, and Reva Siegel as Amici Curiae in Support of Respondents Dobbs v. Jackson Women's Health Organization, 142 S.Ct. 2228 (2022).

[39] Dobbs, 142 S.Ct. at 2246 (quoting Washington v. Glucksberg). Washington v. Glucksberg, 521 U.S. 702, a 1997 case considering the right to physician aid in dying, is often quoted as the guiding principle for unenumerated rights.

[40] *But see* Brief for American Historical Association and Organization of American Historians as Amici Curiae in Support of Respondents, Dobbs v. Jackson Women's Health Organization, 142 S.Ct. 2228 (2022).

that, while penalties for abortion may have differed at common law, no authority endorsed a "positive *right* to procure an abortion."[41]

The Court would not have difficulty finding evidence to support an argument that contraception was not historically viewed as a positive right. For example, the Court could point to Dr. Charles Knowlton's conviction in 1832—thirty-six years before the passage of the Fourteenth Amendment—for publishing the *Fruits of Philosophy*, in which he advocated for the use and benefits of birth control.[42] That he was convicted and sentenced to "three months at hard labor" and his conviction "aroused very little public attention" could be used as evidence that contraception was not viewed as a right.[43] The Court could suggest that if prosecution for even *writing* about birth control was not out of line with legal thinking and public sentiment at the time, it is highly unlikely a positive right to contraception existed.[44]

Further, the Court might consider the Comstock Act, which Congress passed in 1873, five years after the Fourteenth Amendment's ratification.[45] The Comstock Act criminalized mailing "obscene, lewd or lascivious," "immoral," or "indecent" publications, making it a federal offense to disseminate contraception through the mail and across state lines, punishable by up to five years in prison.[46] Soon after, twenty-four of thirty-seven states passed similar laws to restrict contraception access.[47] It was not until the twentieth century that challenges to contraception restrictions were successful, though narrowly construed. In light of these facts, the Court is unlikely to view access to contraception as a right deeply rooted in our history and tradition.

Of course, any discussion of *Dobbs* would be incomplete without addressing what the Court identified as the key distinguishing factor singling out abortion from other substantive due process rights such as intimate sexual relations, marriage, and contraception. The Court emphasized that abortion is fundamentally different because it destroys what the law at issue described as an "unborn human being."[48] But we are intensely skeptical about whether this truly distinguishes abortion

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[41] Dobbs, 142 S.Ct. at 2251 (emphasis in original).

[42] Norman E. Himes, *Charles Knowlton's Revolutionary Influence on the English Birth Rate*, 199 NEW ENG. J. MED. 461, 463 (1928).

[43] *Id.*

[44] *Id.*

[45] *An Act for the Suppression of Trade in, and Circulation of, Obscene Literature and Articles of Immoral Use* (Comstock Act), March 3, 1873, ch. 258, § 2, 17 Stat. 599.

[46] *Id.*

[47] Even a lack of laws criminalizing contraception would not qualify as sufficient evidence under *Dobbs* because "the fact that many States in the late 18th and early 19th century did not criminalize pre-quickening abortions does not mean that anyone thought the States lacked the authority to do so." Dobbs, 142 S.Ct. at 2255.

[48] *Id.* at 2243.

from contraception, and with good reason. The majority opinion in *Burwell v. Hobby Lobby*—also written by Justice Alito, author of the *Dobbs* majority—casts doubt about the sincerity of the claim that abortion and contraception are different. In *Hobby Lobby*, Justice Alito accepted that many contraception methods were abortifacients for the mere fact that the petitioners believed them to be equivalent to abortion.[49] These alleged "abortion-inducing drugs"—as Justice Kavanaugh later called them during his 2018 confirmation hearing[50]—included emergency contraception, often called the "morning after pill," and intrauterine devices (IUDs).[51]

For many, the dividing line between abortion and birth control is not as clear as one might initially assume and rests on a subjective belief about what is medically, legally, and ethically significant. A prevailing definition of pregnancy used by the American College of Obstetricians and Gynecologists is when a sperm penetrates an egg and that fertilized egg implants itself in the uterine wall.[52] By this definition, the mechanism must destroy the implanted embryo or fetus to abort a pregnancy.[53] Neither emergency contraceptives nor IUDs affect an already-implanted embryo. Emergency contraceptives inhibit ovulation, while IUDs primarily operate by changing cervical mucus to make it inhospitable to sperm.[54] These facts should theoretically prevent the contraceptive methods at issue in *Hobby Lobby* from reasonably qualifying as abortifacients.

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[49] 573 U.S. 682, 691 (2014) ("according to their religious beliefs the four contraceptive methods at issue are abortifacients."); *See also* I. Glenn Cohen, Melissa Murray, and Lawrence O. Gostin, *The End of* Roe v. Wade *and New Legal Frontiers on the Constitutional Right to Abortion,* J. AM. MED. ASSOC. Published online July 08, 2022. doi:10.1001/jama.2022.12397.

[50] Jenavieve Hatch, *Brett Kavanaugh Refers to Birth Control As Abortion Inducing Dugs at Confirmation Hearing,* HUFFPOST (September 6, 2018) https://www.huffpost.com/entry/brett-kavanaugh-birth-control_n_5b917b79e4b0162f472b3cb8.

[51] Hobby Lobby, 573 U.S. at 701.

[52] Grace S. Chung, Ryan E. Lawrence, Kenneth A. Rasinski, John D. Yoo, and Farr A. Curlin, *Obstetrician-gynecologists' beliefs about when pregnancy begins,* 206 RESEARCH OBSTETRICS 132.e1, 132.e1 (2012) ("Since 1965, the American College of Obstetricians and Gynecologists (ACOG) has defined *pregnancy* as beginning with implantation of the embryo in the uterine wall. This definition is used also by the Guttmacher Institute, Planned Parenthood, and some textbooks.").

[53] The term "embryo" is used for the first 8 weeks after implantation. 9 weeks after implantation, it is called a fetus. American College of Obstetricians and Gynecologists, *How Your Fetus Grows During Pregnancy* https://www.acog.org/womens-health/faqs/how-your-fetus-grows-during-pregnancy.

[54] Jen Gunter, *The Medical Facts About Birth Control and Hobby Lobby—From an OB/GYN,* THE NEW REPUBLIC (July 6, 2014) https://newrepublic.com/article/118547/facts-about-birth-control-and-hobby-lobby-ob-gyn.

For some, including the corporate leadership of Hobby Lobby, the relevant focal point is not implantation but fertilization,[55] even though fertilization is not a point that science can establish *in vivo* by any existing medical test. For those espousing this perspective, any contraception preventing a fertilized egg from implanting would constitute an abortion. And while the types of contraception at issue in *Hobby Lobby* did not affect a fertilized egg or implanted embryo,[56] it was the mere theoretical possibility that they could prevent a fertilized egg from implanting in the uterus in some small and unspecified number of cases, and the asserted personal beliefs that life begins at conception, that proved sufficient for the Court.[57] *Hobby Lobby* demonstrates that the Court can disregard scientific evidence about how a contraceptive operates based on an individual or group's subjective belief about the contraception or when pregnancy begins. Indeed, the Court makes clear that the judiciary has no authority to address whether religious beliefs are reasonable.[58] Given what it described as high moral stakes, the Court opposed a "binding national answer" to whether these contraceptives equated to abortion.[59] While the Court could require more from a state legislature than the mere belief they accepted from the *Hobby Lobby* plaintiffs, *Dobbs* emphasizes deference to states and elected officials who can best represent their constituency's moral views on abortion. Thus, if a state legislature enshrines the belief that life begins at fertilization into law—as many already have in *Dobbs'*s wake—the Court's opinion in *Dobbs*, along with its broader protection of religious beliefs, suggests a deference to leave this as a "state issue."

This raises the critical question of whether the Court would even need to overturn *Griswold* to enable valid restrictions or bans on certain types of contraception. We do not think it would. If some popular contraceptive methods—like those in *Hobby Lobby*—can be legally

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[55] Claire Horner & Lisa Campo-Engelstein, *Dueling Definitions of Abortifacient: How Cultural, Political, and Religious Values Affect Language in the Contraception Debate,* 50 HASTINGS CENTER REPORT 14 (2020). *See also* United States Conference of Catholic Bishops, Another Look at Contraception, https://www.usccb.org/committees/pro-life-activities/another-look-contraception ("it's scientifically indisputable that a new human life begins when an embryo first forms at fertilization—6 to 8 days *before* implantation."). A slight majority of obstetrician-gynecologists also believe that pregnancy begins at fertilization. Chung et al., *supra* note 52, at 132.e3 (finding that 57% of US obstetrician-gynecologists believe pregnancy begins at conception).

[56] *See* Horner & Campo-Engelstein, *supra* note 55.

[57] Hobby Lobby, 573 U.S. at 723-24.

[58] *Id.* 724.

[59] *Id.* The Court echoed this language in *Dobbs*, chastising *Roe* and *Casey* for "usurp[ing] the power to address a question of profound moral and social important." Dobbs, 142 S.Ct. at 2265. The framing of abortion as a moral issue and one best left to state representatives could lead to the Court accepting more arguments akin to those made in *Gonzales v. Carhart*, in which the Court accepted and found persuasive that "some women come to regret their choice to abort the infant life they once created and sustained," despite having "no reliable data." 550 U.S. 124, 159 (2007).

categorized as abortifacients, they may fall under the abortion restrictions in place after *Dobbs*. And if state legislative trends are successful, even more forms of birth control may qualify as abortions. Louisiana HB813, for example, would have altered the definition of "person" by stating that life begins at the moment of fertilization, independent of implantation.[60] In doing so, the bill aimed to protect a fertilized egg "by the same laws protecting other human beings."[61]

The long and ultimately successful battle to overturn *Roe* illustrates the increasingly powerful political voice of those in the anti-abortion movement, even though they represent a minority viewpoint.[62] This group overlaps with opponents of contraception, which, in our view, makes increased restrictions on birth control all but certain. To support this assertion, consider what happened following *Hobby Lobby*. After the decision, more organizations could avoid providing contraception coverage by simply filling out a form stating their religious objections. The insurance company would then provide payments to beneficiaries for contraceptive services they could acquire independently.[63] But, religious groups challenged this regulation in *Zubik v. Burwell* and *Little Sisters of the Poor v. Pennsylvania*, arguing that filling out a form was still complicit in providing what they believed equated to abortion.[64] Opposition to contraception was at the heart of the matter due to the religious groups' conviction that "deliberately avoiding reproduction through medical means is immoral."[65]

If *Hobby Lobby* walked so *Zubik* and *Little Sisters of the Poor* could run, *Dobbs* is sprinting to usher in an even more aggressive era of minority morality-based restrictions. And these actors now have a new blueprint with Texas's SB8, which further calls into question any need to overturn *Griswold* to achieve widespread restrictions or bans on certain types of contraception. This law allows private citizens to sue anyone who aids or abets a pregnant individual in obtaining an abortion after six weeks and awards a bounty of $10,000 or more.[66] This vigilante approach has opened the door to what is, at least theoretically, constitutionally possible for restricting reproductive rights.[67] And the Supreme Court's willingness to allow SB8 to go into effect while clearly

[60] H.B. 813, Reg. Session (Louisiana 2022).

[61] *Id.*

[62] PEW RESEARCH CENTER, *Public Opinion on Abortion,* (May 17, 2022) https://www.pewresearch.org/religion/fact-sheet/public-opinion-on-abortion/.

[63] Little Sisters of the Poor v. Pennsylvania, 140 S.Ct. 2367, 2375 (2020).

[64] *Id.* at 2376.

[65] *Id.*

[66] *See supra* note 8.

[67] Whole Woman's Health v. Jackson No 22-0033 (Tex. 2022).

violating both *Roe* and *Casey*, which were still in effect at the time, could be seen as an open invitation to these types of restrictions and beyond.[68] For instance, Missouri is trying to stop people from crossing state lines to obtain an abortion through the same method used by Texas, a position that would have previously seemed unimaginable.[69] Contraception bans, then, may just be the tip of the iceberg.

2. State Interests in Fetal Life

The connection between a post-*Dobbs* world and the potential restrictions on contraception stems from the Court's narrow focus on the state's interest in the fetus. The *Dobbs* opinion does not consider the potential impact of overruling *Roe* and *Casey* on the health outcomes of pregnant people, including maternal mortality.[70] Nor does it contemplate how a state may use this increased interest to limit the freedoms and liberties of both those who are pregnant but also anyone who could become pregnant. In light of these omissions, we are left with expanded justification for surveillance and few limits on what the state can do to protect the fetus at "all stages of development."[71]

We have seen this interest taken to extremes even under *Roe*. In *Jefferson v. Griffin Spalding Hospital Authority*, the Supreme Court of Georgia held that a viable fetus had Constitutional rights, allowing the state to override the mother's refusal of a cesarean section.[72] In *Pemberton v. Tallahassee Memorial Regional Medical Center*, a Florida District Court authorized law enforcement to take a woman from her home and return her to the hospital for a cesarean section against her will.[73] In this case, the court used the fact that the woman wanted to give birth against her, outweighing her right to refuse a specific method of birth.[74] In the same vein, after *Dobbs*, courts may weigh the future birth against an individual's right to control any actions that could impact the fetus. Indeed, if the state can force someone to gestate

[68] Whole Woman's Health v. Jackson, 142 S. Ct. 522 (2021).

[69] Caroline Kitchener, *Missouri lawmakers seeks to stop residents from obtaining abortions out of state*, THE WASHINGTON POST (March 8, 2022) https://www.washingtonpost.com/politics/2022/03/08/missouri-abortion-ban-texas-supreme-court/.

[70] In fact, the Court considers the connection between abortion rights and health unclear: "That form of reliance depends on an empirical question that is hard for anyone—and in particular, for a court—to assess, namely, the effect of the abortion right on society and in particular on the lives of women. Dobbs, 142 S.Ct. at 2277.

[71] *Id.* at 2284.

[72] 274 S.E.2d 457, 458 (Ga. 1981).

[73] 66 F.Supp.2d 1247, 1250 (N.D. Fla. 1999).

[74] *Id.* at 1251.

against their will, courts may see everything else as a lesser intrusion on their rights.[75]

The claim in these circumstances was a threat to the fetus's wellbeing. A forced cesarean section is an extreme invasion of personal autonomy. But the constitutional right to refuse unwanted medical treatment—confirmed as a fundamental right by the Court in *Cruzan v. Director, Missouri Department of Health*[76]—was irrelevant if the state considered vaginal birth risky to the fetus. Yet, it is worth noting that a medical certainty of risk has not been required in these cases. *In re Baby Boy Doe*, for example, is another case where the state sought a forced cesarean section because, in its judgment, the fetus stood almost no chance of surviving a natural birth.[77] Notwithstanding numerous efforts from the state, the courts declined to override the competent woman's right to refuse unwanted medical treatment. Despite the near-certain risk of death that the state alleged, the woman vaginally delivered a healthy baby.[78] But the court's decision to allow the woman to determine how to birth stemmed from the woman's right to choose—a choice that *Dobbs* has compromised if not outright eliminated.

These cases clarify that even under *Roe* there was an interest not simply in restricting or minimizing abortion but in controlling pregnancy decisions in the name of the fetus. Post-*Dobbs*, the state's interest in the fetus—and a court's willingness to accept that interest as a justification for restricting or ignoring the rights, preferences, and autonomous choices of pregnant persons—will only increase. After all, if the state can tell you that you must carry a fetus to term and give birth, and even *how* you must give birth, it is difficult to see why this could not extend into increased reproductive surveillance to protect and promote fetal health throughout pregnancy. Even under *Roe*, police interrogation following pregnancy loss has included questions like, "Did you do everything in your power to ensure that you'd have a healthy baby?"[79] *Dobbs* raises the potential to prosecute behaviors during pregnancy in the name of the fetus's expanding rights.

We need not speculate about what type of surveillance this might entail or who it will target because history provides those

[75] *See, e.g.*, *id.* at 1252 ("in *Roe* the Court said a third-trimester mother can be forced against her will to bear a child she does not want; this is in fact a substantially greater imposition on the mother's constitutional interests than requiring a mother to give birth by one method rather than another.").

[76] 497 U.S. 261 (1990).

[77] 632 N.E.2d 326, 328 (Ill. App. Ct. 1994).

[78] *Id.* at 329.

[79] Voluntary Statement of Angela Kennedy (Dec. 11, 1998), State v. Kennedy, No. 03-GS-42–1708 (S.C. Ct. Gen. Sess. Spartanburg County Jan. 5, 2004) (Hayes, J.) (statement resulting from an interrogation in a hospital room).

answers. Even under *Roe*, efforts to police pregnancy were constant. Legislation and enforcement often focused on drug use and were disproportionately imposed against people of color. *Ferguson v. City of Charleston* provides a useful illustration.[80] This case concerned a hospital policy where staff, in collaboration with law enforcement, would test the urine of pregnant patients "suspected of drug abuse" without a warrant or the woman's knowledge or consent.[81] Of the thirty women who were tested and "failed" under the policy, twenty-nine were Black,[82] and the medical record of the one white pregnant woman contained the note that she lived "with her boyfriend who is a Negro."[83] While the policy was formally described as an effort to get these women into substance abuse programs, most were never offered drug treatment before being sent to jail.[84] Thus, a policy that on paper looked like an effort to increase access to substance abuse treatment, in reality, resulted in Black women in shackles and chains.[85]

The persistent and racialized efforts to criminalize crack cocaine included prosecution of pregnant women, despite evidence that the risks to the fetus are surprisingly minimal.[86] This is not to suggest that crack cocaine use during pregnancy is safe, but rather that overstated risks of severe harm helped justify prosecutorial efforts against Black women.[87] This is especially true when compared with other risky but far less criminalized behaviors, such as the use of drugs more likely to be abused by wealthier white people. Even medical journals contributed to the problem, publishing four times as many articles on prenatal

[80] 532 U.S. 67, 68-69 (2001). *Ferguson* was raised in the *Dobbs* oral argument by Justice Thomas. Though not at issue or directly linked to the questions in *Dobbs*, Justice Thomas's invocation of the *Ferguson* facts could indicate a willingness to police pregnancies for the health and wellbeing of the fetus. Transcript of Oral Argument at 49, Dobbs v. Jackson Women's Health Organization, 142 S.Ct. 2228 (2002) (No. 19-1392).

[81] 532 U.S. 67, 68-71 (2001).

[82] We capitalize the "b" in "Black" for the same reasons that Kimberlé Crenshaw articulates in her work. See Kimberlé Williams Crenshaw, Race, Reform, and Retrenchment: Transformation and Legitimation in Antidiscrimination Law, 101 HARV. L. REV. 1331, 1332 n.2 (1988) ("When using 'Black,' I shall use an upper-case 'B' to reflect my view that Blacks, like Asians, Latinos, and other 'minorities,' constitute a specific cultural group and, as such, require denotation as a proper noun." (citing Catharine A. MacKinnon, Feminism, Marxism, Method, and the State: An Agenda for Theory, 7 Signs 515, 516 (1982))); see also Kimberlé Crenshaw, Mapping the Margins: Intersectionality, Identity Politics, and Violence Against Women of Color, 43 STAN. L. REV. 1241, 1244 n.6 (1991) ("By the same token, I do not capitalize 'white,' which is not a proper noun, since whites do not constitute a specific cultural group.").

[83] Lynn M. Paltrow, *Pregnant Drug Users, Fetal Persons, and the Threat to* Roe v. Wade, 62 ALBANY L. REV. 999, 1025 (1999).

[84] *Id.*

[85] *Id.*

[86] Dorothy E. Roberts, KILLING THE BLACK BODY 159 (Vintage Books 2d ed 2017) (1997).

[87] *Id.*

cocaine exposure compared to publications on the effects of the heroin epidemic in the previous decade.[88]

The history of surveilling pregnancy under *Roe* suggests even more draconian policies in the future as the state's interest in the fetus at earlier stages of pregnancy grows. And, as history shows, those policies need only be tenuously linked to scientific evidence, if at all. According to *Dobbs*, the state has a legitimate interest to act in the interest of prenatal life "at all stages of development."[89] Thus, while arguments remain about when pregnancy begins or whether and when a fetus can feel pain, the Supreme Court has made clear that the issue of protecting the fetus is not a scientific or medical issue, but a moral one.[90] And with the Court now proclaiming the rational basis test applies to any reproduction-related restriction, a legitimate interest is all the state needs to justify its actions.[91] Given this low legal threshold, the Court's endorsement of state action to protect prenatal life at all stages, and the decreasing focus on the adverse impact of such actions on women's rights and liberty interests, the government's power to monitor and control behaviors or actions that could be considered risky to fetal health appears unlimited.

If the question truly becomes, "Did you do everything in your power to ensure that you'd have a healthy baby?" then abortion is hardly the stopping point. Eating habits may become increasingly monitored; out of fear over risks to the fetus, particular foods could be seen as potentially dangerous, as could gaining too much or too little weight. Drinking habits may be more heavily scrutinized. Untethered from a need for scientific or medical consensus, the state may disregard any science about whether a half glass of wine poses no risk. There could be a state interest not only in whether someone is exercising but what type of exercise they are doing. Further, if you cannot medically establish the existence of a fertilized egg before it implants, in states that define life as beginning at fertilization, that interest could extend for the entire duration of a person's reproductive life. And while positioning any fertile person with a uterus in a perpetual state of pre-pregnancy may seem farfetched, it would not be the first time a government entity adopted this position to promote fetal health.[92]

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[88] *Id.*

[89] Dobbs, 142 S.Ct. at 2284.

[90] *Id.* at 2258 ("do not claim that any new scientific learning calls for a different answer to the underlying moral question.").

[91] *Id.* at 2284.

[92] *See, e.g.*, Centers for Disease Control and Prevention, *Recommendations to Improve Preconception Health and Health Care—United States: A Report of the CDC/ATSDR Preconception Care Work Group and the Select Panel on Preconception Care* ((April 21, 2006) 55(RR06)

As with increased surveillance and criminalization of pregnancy under *Roe*, this type of monitoring puts people of color at the greatest risk. *Ferguson* demonstrates that these programs typically require an initial assessment of who participates in risky behavior. Black women have disproportionately higher maternal mortality rates and worse birth outcomes.[93] While this is likely due to a number of factors, including racism, this alone could be used to justify an inappropriate focus on this demographic for heightened surveillance and monitoring under the guise of protecting the fetus and newborn. And the shift from *Roe's* strict scrutiny to *Dobbs's* rational basis standard of review will likely provide a shield to any claims of racial profiling.

B. The Potential Promise of Femtech

Unfortunately, the future of reproductive freedoms is unfolding in such a way that the worst possible projections also seem the most likely. After *Dobbs*, this trajectory may extend to restrictions on birth control and increased surveillance of anyone pregnant or capable of becoming pregnant. But innovation in the femtech market could help offset some of the worst possible outcomes by putting apps with the potential to enhance bodily autonomy in the pockets of anyone with a smartphone.

The term "femtech" encompasses a broad range of lucrative products[94] targeting users across the life course.[95] In this category, period and fertility trackers[96] could be among the most promising—and least ethically contentious—choice-preserving tools. Some of these apps could function as birth control. Others could change the narrative on

(suggesting we treat all women as "pre-pregnant" to promote fetal health). More recently the World Health Organization suggested measures to prevent women of childbearing age from consuming alcohol, World Health Organization, *Global Health Action Plan 2022-2030* (June 2021).

[93] Juanita J. Chinn, Iman K. Martin, and Nicole Redmond, *Health Equity Among Black Women in the United States,* 30 J. WOMEN'S HEALTH 212 (2021).

[94] PR Newswire, *Women's Health App Market Worth $8.9 Billion by 2028 | CAGR: 19.0%: Grand View Research, Inc.* (June 14, 2021) https://www.prnewswire.com/news-releases/womens-health-app-market-size-worth-8-9-billion-by-2028--cagr-19-0-grand-view-research-inc-301311421.html; Menstrual health apps represent the largest segment of the women's health app market share, Precedence Research Women's Health App Market (By Type: Fitness & Nutrition, Menstrual Health, Disease Management, Pregnancy Tracking, Menopause, and Others) – Global Industry Analysis, Size, Share, Growth, Trends, Regional Outlook, and Forecast 2021 – 2030, https://www.precedenceresearch.com/womens-health-app-market.

[95] Megan B. Fitzpatrick and Avnesh S. Thakor, *Advances in Precision Health and Emerging Diagnostics for Women,* 8 J. CLIN. MED. 1525 (2019).

[96] Period trackers are occasionally called "menstruapps" Laura Shipp and Jorge Blasco, *How Private is Your Period?: A Systematic Analysis of Menstrual App Privacy Policies,* 4 PROCEEDINGS ON PRIVACY ENHANCING TECHNOLOGIES 491 (2020).

surveillance, shifting it from the prying intrusion to one of empowering self-monitoring. Given their enormous potential reach, period and fertility trackers could theoretically be the discreet and individualized antidote to a world with an increasing sense that pregnant bodies are public property. And this is true regardless of whether a user intends to terminate a pregnancy or carry it to term.

1. Quantifying Fertility

To understand the promise of period and fertility trackers, one must first understand what they are and how they work. These apps include an array of similar products that differ primarily in the data and method used to generate predictions and the product's intended use. Predictions can include dates of menstrual periods, the onset of the symptoms of premenstrual syndrome, ovulation, and fertile windows. Apps generate these predictions through user inputs, which vary depending on the product. Some apps only collect dates.[97] Some are associated with wearables[98] or other devices like proprietary thermometers.[99] Some apps analyze a combination of biological inputs. For others, the algorithm obscures which data points are relevant or how the algorithm uses them.[100]

Apps can theoretically take data and generate reliable predictions because the menstrual cycle is, at least in the abstract, regular and cyclic.[101] In addition to hormone fluctuations, the human body signals fertility through observable physiological changes. These patterns reveal ovulation. For example, one method of predicting ovulation is counting the days between the onset of menstrual

[97] Marguerite Duane et al., The Performance of Fertility Awareness-Based Method Apps Marketed to Avoid Pregnancy, 29 J. AM. BOARD FAM. MED. 508, 508 (2016) (describing an app that uses the "standard days method."). The "standard days method" involves counting days in the cycle. Facts About Fertility, *Standard Days Method,* available at https://www.factsaboutfertility.org/wp-content/uploads/2014/09/StandardDaysPEH.pdf.

[98] Ava Fertility Monitor Bracelet, https://www.avawomen.com/.

[99] Daysy Fertility Monitor Thermometer, usa.daysy.me.

[100] *See supra* note 97; Laetitia Della Bianca, *The Cyclic Self: Menstrual Cycle Tracking as Body Politics,* CATALYST: FEMINISM, THEORY, AND TECHNOSCIENCE 7(1):1-21 at 10–11 (2021) (describing the software as a "black box.").

[101] This is an average length that assumes a regular menstrual cycle, which typically ranges from 21-35 days. However, approximately 14-25% of women have irregular menstrual cycles. National Institutes of Health, *What are Menstrual Irregularities? https://www.nichd.nih.gov/health/topics/menstruation/conditioninfo/irregularities;* Irregular cycles have been associated with factors such as body mass index, stress, and smoking. Jinju Bae, Susan Park, and Jin-Won Kwon, *Factors Associated with Menstrual Cycle Irregularity and Menopause,* BCM WOMEN'S HEALTH 36 (2018).

bleeding.[102] On average, a menstrual cycle is 28 days long, meaning there are 28 days between the first day of one period and the first day of the next.[103] Ovulation is estimated to happen in the middle—in this example, around day 14.[104] Another signal is basal body temperature, which is the temperature of the body when fully at rest.[105] Basal body temperature will peak around ovulation.[106] Lastly, changes in cervical mucus from thick and pasty to a clear, slippery, lubricative consistency can also provide a marker of ovulation.[107] Pregnancy can only occur within a relatively short window of the menstrual cycle—not accounting for sperm survival in the reproductive tract, at the point of ovulation and approximately 24 hours following[108]—so observing these patterns over time can prove useful for avoiding or achieving pregnancy.

With hundreds of period and fertility tracking apps available in the Apple App and Google Play stores—most of which are free—technology has made menstrual tracking more convenient and discreet.[109] And this category of apps is far from niche: some of the largest technology companies offer menstruation tracking features, including Apple, which introduced a period tracking app in 2015,[110] and Google, which added a cycle tracker to its Google Fit product in 2021.[111]

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[102] Jonathan R. Bull, Simon P. Rowland, Elina Berglund Scherwitzl, Raoul Scherwitzl, et al, *Real-World Menstrual Cycle Characteristics of More than 600,000 Menstrual Cycles,* 2 NPJ DIGITAL MED. 83 (2019) (finding that the widely held belief that ovulation occurs consistently on day 14 of the cycle is often not correct).

[103] Dhanalakshmi K. Thiyagarajan, Hajira Basit, and Rebecca Jeanmonod. "Physiology, menstrual cycle." *StatPearls [Internet].* StatPearls Publishing, 2020. https://www.ncbi.nlm.nih.gov/books/NBK500020/.

[104] *Id.*

[105] J.P. Royston, *Basal Body Temperature, Ovulation, and the Risk of Conception, with Special Reference to the Lifetimes of Sperm and Egg,* 38 BIOMETRICS 397 (1982).

[106] *Id.*

[107] Richard J. Fehring, *Accuracy of the Peak Day of Cervical Mucus as a Biological Marker of Fertility,* 66 CONTRACEPTION 231 (2002).

[108] Sperm can survive in the body for up to five days. Some sources account for this fact and estimate that a person can get pregnant approximately 6 days each cycle. Jennifer Rainey Marquez, *How to Chart Your Menstrual Cycle,* Grow by WebMD (February 20, 2020) https://www.webmd.com/baby/charting-your-fertility-cycle.

[109] A 2016 study searching for menstrual cycle tracking apps yielded 1,116 apps Michelle L. Moglia et al., Evaluation of Smartphone Menstrual Cycle Tracking Applications Using an Adapted APPLICATIONS Scoring System, 127 OBSTETRICS & GYNECOLOGY 1153, 1153-55 (2016). 3.3% of apps in the Google Play Store require payment as compared with 6.1% of iOS apps. STATISTICA, *Distribution of free and paid Android apps in the Google Play Store as of March 2022* https://www.statista.com/statistics/266211/distribution-of-free-and-paid-android-apps/; STATISTICA, *Distribution of free and paid iOS apps in the Apple App Store as of March 2022* https://www.statista.com/statistics/1020996/distribution-of-free-and-paid-ios-apps/.

[110] Donna Lu, *The Femtech Gold Rush,* 242 NEW SCIENTIST 3232, 20-21 (2019).

[111] Rita El Khoury, *Google Fit's Health Data is Now More Beautiful and More Functional (APK Download)* ANDROID POLICE (July 29,2021) https://www.androidpolice.com/2021/07/29/google-fits-health-data-is-now-more-beautiful-and-more-functional-apk-download/.

It is no surprise that period and fertility trackers have become mainstream alongside a booming market for consumer-facing digital health products. This type of tracking is part of the broader quantified-self movement, in which various digital monitors and trackers offer high-tech yet "natural" ways to understand, optimize, and control the human body.[112] This meshes seamlessly with the dominant approach to health care in the United States, which has traditionally emphasized personal over collective responsibility and viewed attempts to intervene as paternalistic infringements on individual liberty.

The quantified-self movement positions reproductive bodies within a context of medicalization and risk[113] and operates under the assumption that we can control our bodies through technological self-surveillance.[114] As a result, for many app users, there is a sense that tracking menstrual cycles is not just an optional activity but a requirement of being a good "digitized reproductive citizen."[115] Within this paradigm, there is a belief that intense monitoring is not only good but essential to the health of a pregnant person and, ultimately, through other pregnancy and childcare apps, the health of the fetus and born child.[116] By this logic, failing to self-track is merely a result of laziness, incompetence, indifference, or even ignorance.[117] Possibly even negligence.

2. Contraception

The importance of observing and recording menstrual cycles to prevent pregnancy has long been understood. Improved scientific

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[112] Deborah Lupton, *Quantified Sex: A Critical Analysis of Sexual and Reproductive Self-Tracking Using Apps,* 17 CULTURE, HEALTH & SEXUALITY 440 (2015). *See also* Deborah Lupton, *The Digitally Engaged Patient: Self-Monitoring and Self-Care in the Digital Health Era,* 11 SOCIAL THEORY & HEALTH 256 (2013); Deborah Lupton, *Quantifying the Body: Monitoring and Measuring Health in the Age of mHealth Technologies,* 23 CRITICAL PUB HEALTH 393 (2013).

[113] *See* Lupton, *Quantified Sex*, *supra* note 112; Deborah Lupton, *M-Health and Health Promotion: The Digital Cyborg and Surveillance Society,* 10 SOCIAL THEORY & HEALTH 229, 239 (2012).

[114] Adrienne Evans, Sarah Riley, and Martine Robson, *Postfeminist healthism: Pregnant with Anxiety in the Time of Contradiction,* JURA GENTIUM CENTRE VOL. XVII(1): 95-118.

[115] Deborah Lupton, D, *'Mastering your fertility': the digitised reproductive citizen*. In A. McCosker, S. Vivienne, & A. Johns (Eds.), Negotiating Digital Citizenship: Control, Contest and Culture (pp. 81-93). London: Rowman & Littlefield. (2016); Deborah Lupton, *Apps as Artefacts: Toward a Critical Perspective on Health and Medical Apps,* 4 SOCIETIES 606, 612 (2014); Deborah Lupton, *'Precious Cargo': Foetal Subjects, Risk, and Reproductive Citizenship,* 22 CRITICAL PUBLIC HEALTH 2 (2012).

[116] Deborah Lupton, *Caring Dataveillance: Women's Use of Apps to Monitor Pregnancy and Children,* THE ROUTLEDGE COMPANION TO DIGITAL MEDIA AND CHILDREN. Routledge, 393-402 (2020).

[117] *See* Lupton, *The Digitally Engaged Patient*, *supra* note 112.

knowledge about ovulation in the 1920s led to the "rhythm method,"[118] which evolved with the more nuanced understanding of signals like temperature and cervical mucus into approaches like the Billings Ovulation Method in the 1960s[119] and the Creighton Model in the 1980s.[120] There are now several accepted fertility-awareness-based methods for pregnancy prevention, including calendar, mucus-only, basal body temperature, symptothermal, and urinary-hormone-based methods.[121] These approaches can be effective, and some boast a less than 1% failure rate with perfect use,[122] which is as good as many forms of hormonal contraception and better than many barrier methods.[123]

Importantly, these methods are subject to none of the same criticisms that appear in debates about contraceptive mandates, religious and moral objections, or abortifacient potential identified in Subpart IA1.[124] They mesh with new-age holistic wellness movements vilifying pharmaceuticals and promoting "natural" approaches.[125] Even the Catholic Church, well known to take one of the more extreme positions on birth control, has considered fertility-awareness-based family planning ethically permissible within marriage since 1968.[126] The Church even teaches natural family planning in preparation for the sacrament of marriage.[127] And this support translates to app development. For example, Georgetown University—a Catholic institution that will not dispense hormonal contraception at the on-

[118] The "rhythm method" is not an evidence-based form of fertility-awareness based method of natural family planning. *See supra* note 98.

[119] Carol A. Quarini, *History of Contraception,* 2 WOMEN'S HEALTH MEDICINE 28, (2005).

[120] The Creighton Model, Fertility Appreciation Collaborative to Teach the Science https://www.factsaboutfertility.org/wp-content/uploads/2014/09/CreightonPEH.pdf.

[121] Rachel Peragallo Urrutia & Chelsea B. Polis, *Fertility awareness based methods for pregnancy prevention,* BMJ 366 (2019).

[122] Contraceptive use failure rates are often described for both perfect use and typical use. Perfect use means that the user follows the instruction perfectly—like in a clinical trial or other highly controlled environment. Typical use accounts for errors people make in real life.

[123] *See* Urrutia & Polis, *supra* note 121.

[124] *See supra* Part IA.

[125] Lindsay Gellman, *Who's Afraid of Birth Control,* (May 2, 2022) https://www.thecut.com/2022/05/business-of-birth-control-documentary-review.html.

[126] HUMANAE VITAE (July 25, 1968), Paragraph 16 https://www.vatican.va/content/paul-vi/en/encyclicals/documents/hf_p-vi_enc_25071968_humanae-vitae.html ("the Church teaches that married people may then take advantage of the natural cycles immanent in the reproductive system and engage in marital intercourse only during those times that are infertile, thus controlling birth in a way which does not in the least offend the moral principles which We have just explained…").

[127] UNITED STATES CONFERENCE OF CATHOLIC BISHOPS, *An Analysis of Diocesan Marriage Preparation Policies,* https://www.usccb.org/topics/marriage-and-family-life-ministries/principles-ministry-couples-preparing-marriage#tab--formational-programs.

campus hospital's pharmacy or sell condoms in the student stores[128]—created and launched a natural family planning app.[129]

For people who menstruate but, for whatever reason, cannot use hormonal birth control—either out of preference, contraindication, or because it is unavailable after *Dobbs*—using an app to identify fertile days can help a user know when to avoid intercourse or use other forms of contraception to avoid pregnancy.[130] Apps specifically designed to prevent pregnancy include *Natural Cycles*, the first FDA-cleared software application as contraception,[131] and *Clue*, which obtained FDA clearance through the 510(k) approval pathway in 2021 after demonstrating substantial equivalence to *Natural Cycles*.[132] The FDA defines software application as contraception as a "device that provides user-specific fertility information for preventing a pregnancy."[133] This includes algorithms that analyze patient-specific data to identify fertile and non-fertile days and provide patient-specific contraception recommendations.[134] The FDA classifies contraceptive apps as Class II devices—the same as many common types of condoms.[135]

In light of this classification, the FDA requires special controls, including performance testing to demonstrate effectiveness; human factors performance evaluation to demonstrate intended users can self-identify; software verification, validation, and hazard analysis; and labeling.[136] Labels must include four specific warnings and precautions: a statement (1) that no contraceptive method is 100% effective, (2) that another form of contraception (or abstinence) must be used on specified days, (3) of any factors affecting the accuracy of contraceptive information, and (4) warning that the application cannot prevent sexually transmitted infections.[137] The FDA also imposes additional obligations, including requirements for the hardware platform and

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[128] H*yas For Choice, Birth Control Coverage @ Georgetown, https://www.hyasforchoice.com/faq-s#:~:text=Due%20to%20its%20Catholic%20affiliation,sale%20of%20condoms%20on%20campus.

[129] *See supra* note 10. Marquette has also developed an app.

[130] *See* Horner & Campo-Engelstein, *supra* note 55, at 14 (describing ovulation through the fetal period).

[131] U.S. FOOD AND DRUG ADMINISTRATION, *FDA allows marketing of first direct-to-consumer app for contraceptive use to prevent pregnancy* (August 10, 2018) https://www.fda.gov/news-events/press-announcements/fda-allows-marketing-first-direct-consumer-app-contraceptive-use-prevent-pregnancy.

[132] U.S. FOOD AND DRUG ADMINISTRATION, 510(k) Premarket notification for Clue Birth Control https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfpmn/pmn.cfm?ID=K193330.

[133] 21 CFR § 884.5370(a).

[134] *Id.*

[135] The FDA classifies condoms and condoms with spermicidal lubricant as Class II devices. 21 CFR § 884.5300 and 21 CFR § 884.5310, respectively.

[136] 21 CFR § 884.5370(b).

[137] 21 CFR § 884.5370(b)(4)(i)(A-D).

operating system, instructions identifying and explaining how to use the app, and a summary of clinical validation studies and results, including effectiveness as a standalone contraceptive and how that compares to other forms of legally marketed contraceptives.[138]

Software as contraception will be critically important after *Dobbs*. When these apps work, users have access to effective and discreet birth control. With regular menstrual cycle monitoring, users can know if they are pregnant the day their period is late so they can plan for termination—especially in states with ever-shrinking windows for legal abortions. And for those who will have to travel out of state for care, early notification can give a user more time to plan to travel long distances, which is often costly and logistically difficult.[139]

3. Conception and Beyond

Period and fertility tracking apps are also beneficial for consumers interested in becoming pregnant because accurately identifying ovulation can help target intercourse on a user's most fertile days, thereby increasing the chances of conception.[140] Though the same information—the fertile window—is relevant to both preventing and achieving pregnancy, the FDA currently distinguishes between apps intended for contraception and those intended for "proception."[141] In contrast to contraceptive devices, proceptive devices identify fertile days but may not claim that the user can rely on this information for contraceptive purposes.[142] The FDA exercises enforcement discretion over proceptive devices.[143] Enforcement discretion means the FDA does

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[138] 21 CFR § 884.5370(b)(4)(ii-iv).

[139] Jolie McCullough & Neelam Bohra, *As Texans Fill Up Abortion Clinics in Other States, Low-Income People Get Left Behind,* TEXAS TRIBUNE (September 3, 2021) https://www.texastribune.org/2021/09/02/texas-abortion-out-of-state-people-of-color/.

[140] Alexander Freis, Tanja Freundl-Schutt, Lisa-Maria Wallwiener, Sigfried Baur, Thomas Strowitzki, Gunter Freundl, and Petra Frank-Hermann, *Plausibility of Menstrual Cycle Apps Claiming to Support Conceptions,* 98 FRONTIERS IN PUBLIC HEALTH 1 (2018); Carlotta Favaro, Jack T.Pearson, Simon P. Rowland, Annie Marie Jukic, et al, *Time to Pregnancy for Women Using a Fertility Awareness Based Mobile Application to Plan a Pregnancy,* 30 J. WOMEN'S HEALTH 1538 (2021); Pippa Grenfell, Nerissa Tilouche, Jill Shawe, and Rebecca S. French, *Fertility and Digital Technology: Narratives of Using Smartphone App 'Natural Cycles' While Trying To Conceive,* 43 SOCIOLOGY OF HEALTH & ILLNESS 116 (2021).

[141] U.S. FOOD AND DRUG ADMINISTRATION Product Classification https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfPCD/classification.cfm?ID=LHD. Apps associated with wearables are more likely to accurately predict fertile windows and ovulation. Tracy Y. Zhu et. al. *Accuracy of a Wrist-Worn Medical Device To Identify Fertile Windows and Ovulation Day,* ASRM Abstracts 116:3 (September 2021).

[142] *See supra* notes 133-35 and accompanying text.

[143] *Examples of Software Functions for Which the FDA will Exercise Enforcement Discretion*, FOOD AND DRUG ADMINISTRATION, https://www.fda.gov/medical-devices/device-software-

not plan to enforce otherwise applicable regulatory requirements or expect a developer to submit a 510(k) so long as they do not cross the limits of exemptions.[144] The FDA retains post-market authority even if it has exercised enforcement discretion over a device.[145]

Accurate and effective proceptive apps are helpful for anyone interested in facilitating conception and menstruation tracking more generally. However, they potentially have an increasingly important role to play in a post-*Dobbs* world where pregnancy surveillance increases alongside the state's interest in the potential life and health of the fetus. When proceptive apps work well, they help consumers be the good "digitized reproductive citizens" envisioned by the quantified-self movement.[146] These consumers will know they are pregnant early, potentially the exact day the app alerts them to a late period, and, therefore, seek prenatal care quickly and modify behaviors to support the health of the fetus. Early changes can help avoid civil and criminal penalties for real or perceived fetal-harming behaviors. In other words, these users *could* do everything in their power to ensure they have a healthy baby.[147]

Given period and fertility tracking apps' diverse potential benefits beyond contraception and conception,[148] it is no surprise that as many as one-third of U.S. women track their fertility or menstrual cycle using an app.[149] In a post-*Dobbs* world, many more people may

functions-including-mobile-medical-applications/examples-software-functions-which-fda-will-exercise-enforcement-discretion (last visited 02/05/2022).

[144] 21 CFR § 884.9.

[145] *Policy for Device Software Functions and Mobile Medical Applications*, U.S. FOOD & DRUG ADMIN. https://www.fda.gov/regulatory-information/search-fda-guidance-documents/policy-device-software-functions-and-mobile-medical-applications (last updated Sept. 27, 2019).

[146] Deborah Lupton, D, *'Mastering your fertility': the digitised reproductive citizen*. In A. McCosker, S. Vivienne, & A. Johns (Eds.), Negotiating Digital Citizenship: Control, Contest and Culture (pp. 81-93). London: Rowman & Littlefield. (2016).

[147] *See supra* note 79; Deborah Lupton, *'Precious Cargo': Foetal Subjects, Risk, and Reproductive Citizenship,* 22 CRITICAL PUBLIC HEALTH 2, 337 (September 2012).

[148] Consumers may wish to anticipate menstruation dates to plan activities and vacations or purchase menstrual products before bleeding. They are also useful for monitoring health conditions that fluctuate with hormones, such as migraines, mood, and athletic performance. Andrea Ford, Guilia Togni, and Livia Miller, *Hormonal Health: Period Tracking Apps, Wellness, and Self-Management in the Era of Surveillance Capitalism,* 7 ENGAGING SCI. TECH & SOC. 48, 49 (2021). Consumers may wish to use the data to inform conversations with their medical providers or simply want to know their bodies a little better. Johanna Levy and Nuria Romo-Aviles, *"A Good Little Tool to Get to Know Yourself a Bit Better": A Qualitative Study on User's Experiences of App-Supported Menstrual Tracking in Europe,* 19 BMC PUB. HEALTH 1213 (2019); Bianca *supra* note 100; Michael Morrison, *The Datafication of Fertility and Reproductive Health: Menstrual Cycle Tracking Apps and Ovulation Detection Algorithms,* 11 J. RESEARCH IN GENDER STUDIES 139 (2021).

[149] Donna Rosato, *What Your Period Tracker App Knows About You,* CONSUMER REPORTS (January 28, 2020) https://www.consumerreports.org/health-privacy/what-your-period-tracker-

turn to period and fertility apps to meet menstrual and reproductive health needs. And as reproductive intentions—and consequently the motivation for app use[150]—change over time, this routinized tracking has the potential to help all users avoid becoming part of *Dobbs*'s future ruin.

II. FEMTECH'S DYSTOPIA

On their face, period and fertility tracking apps offer promising solutions to increase bodily autonomy at a time when the outlook for reproductive rights is increasingly bleak. But these technologies are also dangerous. This Part forecasts femtech's dystopian future. It then turns to the regulatory and legal environment to explore how current conditions not only fail to prevent the worst possible outcomes but may actively facilitate them.

A. Femtechnodystopia

For period and fertility tracking apps to preserve bodily autonomy and reproductive freedom, they must be accurate, the data must be private and secure, and consumers must know about the risks and limitations of app use. But these conditions are, at best, imperfectly satisfied and, at worst, completely unmet. As a result, ineffective period and fertility tracking apps may increase pregnancy rates, and insecure apps may augment reproductive surveillance.

1. Inaccurate Apps

Most proceptive period and fertility tracking apps are ineffective.[151] Study after study reveals that apps struggle to make

app-knows-about-you-a8701683935/ (citing KAISER FAMILY FOUNDATION, Health Apps and Information Survey September 2019, https://files.kff.org/attachment/Topline-Health-Apps-and-Information-Survey-September-2019).

[150] Sarah Earle, Hannah R. Marston, Robin Hadley, and Duncan Banks, *Use of Menstruation and Fertility App Trackers: A Scoping Review of the Evidence,* 47 BMJ SEXUAL & REPRODUCTIVE HEALTH 90, 101 (2021) (concluding that "motivations for fertility app use are varied, overlap and change over time.").

[151] Britt Lunde et al., *An Evaluation of Contraception Education and Health Promotion Applications for Patients*, 27 WOMEN'S HEALTH ISSUES 29, 34 (2017); Moglia et. al. *supra* note 109, at 1153-55; Duane et al., *supra* note 97; Sarah Johnson, Lorrae Marriott & Michael Zinamen, *Can Apps and Calendar Methods Predict Ovulation with Accuracy?* 34 CURRENT MEDICAL RESEARCH AND OPINION 1587 (2018); Lauren Worsfold, Lorrae Marriott, Sarah Johnson, and Joyce C. Harper, *Period Tracker Applications: What Menstrual Cycle Information Are They Giving Women?* 17 WOMEN'S HEALTH 1 (2021); Lauren Worsfold, Lorrae Marriott, Sarah Johnson, & Joyce C. Harper, *P-469 Period Tracker Applications—are they giving women accurate menstrual cycle information?*

accurate predictions, especially when synthesizing irregular menstrual cycle data.[152] Many apps only evaluate menstrual cycle dates, even though it is impossible to know if someone is ovulating using this outdated approach.[153] Some studies put the accuracy of certain types of ovulation prediction at no greater than 21%.[154] Other research has had to exclude identified apps from the study sample for containing inaccurate information.[155] An even more recent study that purported to show impressive app-specific efficacy data[156] was retracted[157] after subsequent research questioned data collection and analysis.[158]

The lack of evidence base is unsurprising. Recall that, though the FDA regulates software as contraception, it exercises enforcement discretion over proceptive apps because it considers them low risk. As a result, most apps do not have to demonstrate accuracy before going to market. However, just because an app does not market itself as contraception does not mean a consumer will appreciate the distinction and not use it for contraceptive purposes.[159]

HUMAN REPRODUCTION 36 Supp 1 (July 2021) (finding that the top 10 period trackers gave conflicting information on period dates, ovulation day, and the fertile window); Roshonara Ali, Zeynep B. Gürtin, & Joyce C. Harper, *Do fertility tracking applications offer women useful information about their fertile window?* 42 REPRODUCTIVE BIOMEDICINE ONLINE 273 (2021) (finding that 54.4% of apps included in a sample of 90 used only calendar dates to predict ovulation, which the author notes is "impossible.").

[152] *See* Worsfold et al. *supra* note 152, at 7 (showing that apps struggle to make predictions when presented with irregular menstrual cycle data); Duane et al., *supra* note 101, at 508 (noting that as many as 25% of women have irregular periods and those rates only increase with body mass index and stress).

[153] Bull, *supra* note 102; Ali et. al., *supra* note 151, at 277.

[154] Johnson et. al., *supra* note 151, at 1587-94 (finding "Accuracy of ovulation prediction was no better than 21% by the apps").

[155] Lunde et al., *supra* note 151, at 34 ("More than one-third of identified apps were excluded from this review for containing inaccurate information."); Moglia et. Al., *supra* note 109, at 1153-55 (noting that of the 108 apps that fit the study criteria, 88 apps were eliminated due to the inclusion of misinformation and other inaccuracies).

[156] Martin C. Koch et. Al., *Improving Usability and Pregnancy Rates of a Fertility Monitor By And Additional Mobile Application: Results of A Retrospective Efficacy Study of Daysy and DaysyView App,* 15 REPRODUCTIVE HEALTH 37 (2018).

[157] *Retraction Note: Improving Usability and Pregnancy Rates of a Fertility Monitor By And Additional Mobile Application: Results of A Retrospective Efficacy Study of Daysy and DaysyView App,* 16 REPRODUCTIVE HEALTH 54 (2019).

[158] Chelsea B. Polis, *Published Analysis of Contraceptive Effectiveness of Daysy and DaysyView App is Fatally Flawed,* 15 REPRODUCTIVE HEALTH 113 (2018).

[159] Katie Palmer, *How Will Doctors Talk To Patients About Contraception Apps Like Natural Cycles and Clue,* STAT NEWS (March 12, 2021), https://www.statnews.com/2021/03/12/doctors-talk-contraception-apps-natural-cycles-clue/ ("Brayboy said the impetus for creating Clue's upcoming feature was the company's discovery that 20% of its users were using the menstrual tracking app for birth control. In late February, Clue removed a feature called the "fertile window" that could have encouraged users to employ the uncleared app as birth control; now, they can only see their predicted day of ovulation.").

Further, many period trackers are not founded on evidence-based methods of fertility-awareness-based family planning.[160] Even when they are, these methods can have as poor as an 11-34% failure rate with typical use,[161] which is about as effective as the withdrawal method.[162] And because these apps often lack necessary instructions or educational components, many people will not understand their nuances—such as variables that invalidate a basal body temperature reading, like stress, travel, alcohol consumption, and sleep—further reducing their effectiveness.[163] And this, of course, does not account for users who have no say in if, when, how, or with whom they participate in intercourse capable of producing a pregnancy, for whom even the most perfect app will do nothing.[164] Thus, increased app uptake as a standalone form of birth control, especially for consumers who conflate contraceptive and proceptive apps, will inevitably result in more unintended pregnancies.

2. Bleeding Data

The fact that these apps are often inaccurate is not surprising when you consider that the point for most is not to be effective at achieving advertised outcomes but to monetize user data.[165] And there is a lot of data to monetize. In light of the physiological signs of ovulation necessary to generate predictions, the scope of this data collection can include the lengths and specific dates of menstrual cycles and ovulation.[166] More than date ranges or points on a calendar, the data collection can become intensely intimate. Some data raises no more red flags than a diet tracker, including height, weight, food, and

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[160] *See* Duane et al., *supra* note 98, at508 (observing that "The majority of fertility apps are neither designed for avoiding pregnancy nor founded on evidence based FABMs.").

[161] *See* Urrutia & Polis, *supra* note 122.

[162] *Id.*

[163] Duane et al., *supra* note 97 (concluding that "Relying solely on an app to use an FABM, without appropriate training in the method, may not be sufficient to prevent pregnancy"). *See also* Nicole Wetsman, *Why You Should Not Trust Fertility Apps - Yet*, SLATE (Sept. 19, 2018, 9:00 AM), https://slate.com/technology/2018/09/fertility-apps-birth-control-evidence.html ("The quality of the evidence around fertility awareness apps is a particular concern because most people using them probably don't have prior exposure to the science around fertility awareness methods or realize what they actually need to do in order to use them properly."). *But see* Bianca, *supra* note 100 at 9-10 (describing the results of qualitative interviews in which users did not consider apps to be the singular authoritative position on ovulation and instead engaged in other confirmatory measures—like urine test strips—to confirm an app's prediction).

[164] *See supra* note 100, at 17.

[165] Marielle S. Gross, Amelia Hood, and Bethany Corbin, *Pay No Attention to That Man Behind the Curtain: An Ethical Analysis of the Monetization of Menstruation App Data*, 14 IJFAB: INTERNATIONAL JOURNAL OF FEMINIST APPROACHES TO BIOETHICS 144 (2021).

[166] *See* Shipp & Blasco, *supra* note 96, at 504.

exercise.[167] Other data collection can include the position of a user's cervix (high, soft & open, low, hard & closed)[168] and characteristics of vaginal discharge and cervical mucus, including color, texture, and odor. Some apps ask about symptoms, like tender breasts or cramps, and want to know if a user is happy, stressed, calm, or tired.[169] Apps want to know if a user got sick or used medications.[170] It can also include data about sexual activity, including the time and dates of intercourse, libido, sexual position, condom use, and whether the user or their sexual partner orgasmed (or faked it).[171] Some apps ask if users consumed alcohol or other substances[172] or track "partying" as activity data.[173] Other apps allow users to share their account information with a sexual partner, presumably to plan intercourse.[174] And some consumers—particularly adolescents—also use this account sharing feature to share menstrual data with friends for support and connection.[175] Data sets may also explicitly[176] or implicitly[177] include information about dates of abortions and miscarriages. And, when factoring in free-form text a user enters into discussion threads or notes sections, available user data is limited only by the consumer's willingness to share.[178]

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[167] Sadaf Khan, *Data Bleeding Everywhere: A Story of Period Trackers,* DEEP DIVES (June 7, 2019) https://deepdives.in/data-bleeding-everywhere-a-story-of-period-trackers-8766dc6a1e00.

[168] *Id.*

[169] *Id.* (including screenshots of Glow Eve's user interface).

[170] *Id.*

[171] Jerry Beilinson, Glow Pregnancy App Exposed Women to Privacy Threats, Consumer Reports Find, CONSUMER REP. (July 28, 2016), https://www.consumerreports.org/mobile-security-software/glowpregnancy-app-exposed-women-to-privacy-threats; *See also* Shipp and Blasco *supra* note 96 at 491.

[172] Privacy International, *No Body's Business But Mine: How Menstruation Apps Are Sharing Your Data,* (October 7, 2020) https://privacyinternational.org/long-read/3196/no-bodys-business-mine-how-menstruations-apps-are-sharing-your-data.

[173] Privacy International, *We Asked Five Menstruation Apps For Our Data And Here Is What We Found,* (December 4, 2020) https://privacyinternational.org/long-read/4316/we-asked-five-menstruation-apps-our-data-and-here-what-we-found (reporting on a Data Subject Access Request and displaying entries that described bowel movements, partying, and whether the user took their birth control pills).

[174] Karen E. C. Levy, *Intimate Surveillance,* 51 IDAHO L. REV. 679 (2015); Lauren Goode, Max Levchin's New Plan: To Get You Pregnant (And Improve Health Care in the Process), ALL THINGS D (May 29, 2013, 11:14 AM), http://allthingsd.com/20130529/max-levchinsnew-plan-to-get-you-pregnant-and-improve-health-care-in-the-process/ ("the app might remind a woman on an especially fertile day that it's a good time to wear nice underwear. Her partner might receive a notification on the same day to bring flowers home.").

[175] Leah R. Fowler, Charlotte Gillard, Stephanie R. Morain, *Teenage Use of Smartphone Applications for Menstrual Cycle Tracking,* 145 PEDIATRICS 2019 (2020).

[176] Ali et. al., *supra* note 151, at 279 (finding that 2 apps in a sample of 90 tracked information about miscarriage).

[177] If a user has a missed period and then several weeks later resumes menstruating, this data could imply an abortion or a miscarriage.

[178] *See supra* note 167 (discussing how discussion forums also count as data).

Period and fertility tracking data are already shared and sold, and they are exceptionally valuable. Research suggests that a pregnant person's data is worth fifteen times that of the average person.[179] And this says nothing of the obvious value these data have for abusive partners[180] and hackers who may need little more than a user's email address to access deeply personal information.[181] Thus, as app use increases, so too does the pool of available menstrual data, and bad actors will use these data for reproductive surveillance regardless of a user's intention to terminate or carry the pregnancy to term.

3. Consumer Ignorance

Increased reliance on period and fertility trackers as birth control will likely lead to unintended pregnancies from ineffective apps and user error and greater risks for more people for the data these tools contain. Unfortunately, consumers are not well-positioned to understand the limits of accuracy and privacy.[182] This is due, in part, to how apps convey (or remain silent about) this information.[183] Developers commonly include pertinent information—such as medical disclaimers, limitations on liability, fitness descriptions for specific purposes, and statements about data sharing and protection—in terms of service and privacy policies. These digital documents are subject to valid criticisms for being difficult to find and understand[184] and are frequently subject to unilateral change.[185] Medical disclaimers may be obscured by legal jargon and passive voice or hidden at the bottom of

[179] *See supra* note 172.

[180] *See* Levy, *supra* note 174, at 686-87.

[181] *See supra* note 171.

[182] *See supra* note 167. (describing interviews with period and fertility tracker users in which they did not understand the limits of privacy or efficacy and doubting anyone would have any use for the data they log).

[183] *See* Ali et. al., *supra* note 151, at (finding that in a study of 90 apps, only 10% advised against the use of their app as contraception and only 35% state that their app was not a medical device and thus should not be used for medical purposes).

[184] Caroline Cakebread, *You're Not Alone, No One Reads Terms of Service Agreements*, BUS. INSIDER (Nov. 15, 2017), www.businessinsider.com/deloitte-study-91-percent-agree-terms-of-service-without-reading-2017-11 (finding 91% of consumers consent to legal terms and services conditions without reading them, rising to 97% for people ages 18-34); Ali Sunyaev et al., Availability and Quality of Mobile Health App Privacy Policies, 22 J. AM. MED. INFORM. ASSOC. e28, e31 (2015); Nili Steinfeld, *"I Agree to the Terms and Conditions": (How) do Users Read Privacy Policies Online? an Eye-Tracking Experiment*, 55 COMPUTERS IN HUMAN BEHAV. 992 (2016); Leah R. Fowler et al., *Readability and Accessibility of Terms of Service and Privacy Policies for Menstruation-Tracking Smartphone Applications*, HEALTH PROM. PRAC., Feb. 2020.

[185] Leah R. Fowler, Jim Hawkins, and Jessica L. Roberts, *Uncertain Terms*, 97 NOTRE DAME L. REV. 1 (2021); Jessica L. Roberts & Jim Hawkins, *When Health Tech Companies Change Their Terms of Service*, 367 SCIENCE 745, 745 (2020).

already tedious documents.[186] And research reveals that many privacy policies treat the intimate data contained in period and fertility apps no differently than any other consumer information.[187] Some privacy policies do not even contemplate the use and management of reproductive data at all.[188]

Worse, the content in terms of service and privacy policies often contradicts other highly visible marketing and product designs.[189] For example, a previous FDA investigation into one proceptive app revealed a section of the website that stated "if [users] no longer want to use the pill, IUDs and similar methods" and "find contraception with condoms or diaphragms bothersome," then "natural family planning with [the app] offers many advantages and *absolutely no disadvantages*."[190] Even visual cues like using the color green to indicate "not fertile" and red to indicate "fertile" suggest use as contraception, regardless of warranties or disclaimers. But despite its investigation, the FDA did not require the app to submit a 510(k), only that it limit its marketing. In light of the stark contrast between an app interface and marketing language the user sees and the terms of service they almost certainly did not read, it is no wonder that consumers do not appreciate the risks.

4. A Period Panopticon

It is convenient to think an app could provide an easy solution to the problems *Dobbs* creates. But that view discounts the additional risks apps create when they do not work as advertised, the data are not secure, and people are ill-informed of the risks. Instead of empowering self-surveillance, period and fertility tracking apps may merely put users in a femtechnodystopic panopticon.[191] It is not just that we are reverting to a pre-*Roe* world, but that we are doing so with technology in place that would have been unfathomable in 1973.[192] As a result, these apps will become increasingly relevant as states restrict access to contraception and conduct reproductive surveillance.

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[186] *See* Leah R. Fowler et al., *supra* note 184, at 4 (reporting that one app would require nearly 85 scrolls on an iPhone 8 to read to completion).

[187] *See* Shipp & Blasco, *supra* note 96, at 504-05.

[188] *Id.* at 491.

[189] Memo, FDA. (on file with authors).

[190] *Id.* (emphasis added).

[191] The panopticon is a reference to a prison structure first invented by Jeremy Bentham and later expanded as a symbol of everyday social control by Michel Foucault. See generally Jeremy Bentham THE PANOPTICON WRITINGS (1787); Michel Foucault DISCIPLINE AND PUNISH: THE BIRTH OF THE PRISON (1975).

[192] Elizabeth Joh, *The Potential Overturn of* Roe *Shows Why We Need More Digital Privacy Protections,* SLATE (May 9, 2022) https://slate.com/technology/2022/05/roe-overturn-data-privacy-laws.html.

The Court in *Dobbs* identified societal, legal, and medical shifts that the Court concludes would render abortion access nonessential. The Court may also consider technological advancements in software as contraception as justification for allowing restrictions on more objectional forms of birth control—like those at issue in *Hobby Lobby*.[193]

But even if we do not see femtech as an argument for greater restrictions on other forms of contraception, the possible nefarious uses for the data these technologies contain will inevitably expand after *Dobbs*. Law enforcement in states with more aggressive restrictions may be interested in preventing abortions or arresting those suspected of having self-induced or otherwise illegal abortions. Indeed, online behaviors—including Google search history—have already been used as evidence of criminal intent in cases involving "suspicious" miscarriages, and prosecutor reliance on these digital trails will likely only intensify.[194] Menstrual trackers can reveal a possible abortion when data show a late period that later resumes, particularly if it resumes after location data confirm a consumer crossed state lines to a jurisdiction where abortion is legal. While unusual menstrual data patterns can mean many things, like irregular periods or simply inconsistent tracking, bad data are not a hurdle to raising law enforcement suspicion or prosecution.

Some apps already disclaim that they share information with law enforcement in their privacy policies, and all do so in response to legally obtained warrants.[195] Using menstrual cycles to estimate how far a pregnancy has gestated, period and fertility tracking data could effectuate current and evolving enforcement mechanisms for ever-shrinking windows for legal abortion.[196] Indeed, menstrual data has already been relevant to abortion restrictions. Missouri previously used spreadsheets of patients' period data in investigations of Planned Parenthood and so-called "failed abortions."[197] And Immigration and Customs Enforcement under the Trump Administration also tracked menstrual cycles to stop migrants from obtaining lawful abortions.[198]

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[193] *See supra* notes 49-51 and accompanying text.

[194] Cynthia Conti-Cook, *Surveilling the Digital Abortion Diary,* 50 U. BALTIMORE L. REV. 1 (2020) (discussing Rodgers v. State, 166 So. 3d 537, 547 (Miss. Ct. App. 2014)).

[195] Carpenter v. United States, 138 S.Ct. 2206 (2018).

[196] Oliver Kim & Tamara Kramer, *The Girl with the Cyber Tattoo: Applying a Gender Equity Lens to Emerging Health Technology,* 12 NORTHEASTERN U. L. REV. 1, 327, 356-57 (2020).

[197] Yasmeen Abutaleb & Emily Wax-Thibodeaux, *Missouri reviewed data about Planned Parenthood's patients, including their periods, to identify failed abortions,* THE WASHINGTON POST (November 30, 2019) https://www.washingtonpost.com/health/missouri-tracked-planned-parenthood-patients-periods-in-spreadsheet-top-health-official-says/2019/10/30/e96791d0-fb42-11e9-ac8c-8eced29ca6ef_story.html.

[198] Jennifer Wright, *The U.S. Is Tracking Migrant Girls' Periods to Stop Them From Getting Abortions,* HARPER'S BAZAAR (April 2, 2019)

Period and fertility tracking apps simply make those data significantly easier to obtain and exploit at scale.

But it could get even worse. For example, some period and fertility tracking apps allow users to input information about substance use—like if and when a user consumed alcohol.[199] It (or other apps or social media) may even indicate more mundane but nevertheless potentially fetal-harming activities, such as whether the pregnant person consumed unsafe foods.[200] Period and fertility tracking apps, alongside other methods of technological self-surveillance, enhance normative expectations of discipline that frequently accompany increasing control of an individual's reproductive rights.[201] And that data could be used to police pregnant people or as evidence of guilt in the case of a suspicious miscarriage or stillbirth. And such a scenario is not a stretch because gradations of this problem exist now and have long existed with *Roe* and *Casey* in place. It is not such a stretch from one fetal-harming behavior to the next when we are already willing to arrest people for, among other things, falling down while pregnant,[202] using legal (and illegal) substances,[203] giving birth at home,[204] refusing a cesarean section,[205] or ignoring a physician's recommendation for bed rest.[206] Period and fertility tracking apps, alone or analyzed in conjunction with other smartphone data, just expand the limits of what can realistically be criminalized and substantiated.[207]

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https://www.harpersbazaar.com/culture/politics/a26985261/trump-administration-abortion-period-tracking-migrant-women/.

[199] *See supra* note 172.

[200] Kira Proehl, *Pregnancy Crimes: New Worries to Expect When You're Expecting,* 53 SANTA CLARA L. REV. 2 (2013).

[201] *See supra* note 114, at 98.

[202] Robin Levinson-King, *US women are being jailed for having miscarriages,* BBC NEWS (November 12, 2021) https://www.bbc.com/news/world-us-canada-59214544.

[203] Cecilia Nowell, *She Used Drugs While Pregnant. Should She Be in Prison?* THE CUT (September 20, 2021) https://www.thecut.com/2021/09/feature-adora-perez-stillbirth-prison.html; Cecilia Nowell, *A Mom Was Charged With Child Neglect For Using Medical Marijuana While Pregnant. The Arizona Case Could Set a Precedent.* THE LILY (September 13, 2021) https://www.thelily.com/a-mom-was-charged-with-child-neglect-for-using-medical-marijuana-while-pregnant-the-arizona-case-could-set-a-precedent/; Cecilia Nowell, *Kim Blalock Took Lawfully Prescribed Pain Killers During Pregnancy—and Was Charged With A Felony,* ELLE (April 6, 2022) https://www.elle.com/culture/a39541235/kim-blalock-took-lawfully-prescribed-pain-killers-during-pregnancyand-was-charged-with-a-felony/.

[204] *See supra* note 202.

[205] Mother Who Avoided C-Section Gets Probation, LA TIMES (April 30, 2004) https://www.latimes.com/archives/la-xpm-2004-apr-30-na-briefs30.3-story.html.

[206] Susan Donaldson James, *Pregnant Woman Fights Court Ordered Bed Rest,* ABC NEWS (January 14, 2010) https://abcnews.go.com/Health/florida-court-orders-pregnant-woman-bed-rest-medical/story?id=9561460#.UB_djfvQgcu.

[207] Shoshana Wodinsky, *Your Phone Is a Goldmine of Hidden Data for Cops. Here's How to Fight Back,* GIZMODO (June 2, 2020) https://gizmodo.com/your-phone-is-a-goldmine-of-hidden-data-for-cops-heres-1843817740; See also Logan Koepke, Emma Weil, Urmila Janardan, Tinuola

Finally, the data period and fertility trackers contain, especially in combination with location data[208] or search history,[209] have obvious appeal to the latest legislative developments in civil actions against those performing or aiding and abetting abortions—even if the abortion occurs across state lines—opening the risks beyond those who are pregnant.[210] And recall that some period and fertility tracking apps have functionalities where users can share menstrual data with intimate partners and friends.[211] In these circumstances, for example, an abusive partner interested in capitalizing on enforcement bounties would not even need to be an experienced hacker because the data would already be available in their synced companion account.[212]

These risks are not evenly distributed. Those with the most to lose after *Dobbs* also have the most to lose in femtech's dystopian future. The cost of an evidence-based app suitable for contraceptive purposes is nontrivial.[213] *Natural Cycles* costs $89.99 per year for an annual subscription or $9.99 per month plus $14.50 for their basal thermometer.[214] When considering this expense compared to a free and visually identical but non-evidence-based proceptive app, it is clear that many consumers—especially those from disadvantaged groups—will unknowingly end up with less effective and less secure apps.

To summarize, period and fertility tracking apps are plagued with efficacy and privacy problems, and users are often in the dark about their vulnerabilities. Here, femtech's story is not one of promise and self-empowerment but of profound peril for privacy, autonomy, and

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Dada and Harlan Yu, *Mass Extraction: The Widespread Power of U.S. Law Enforcement to Search Mobile Phones,* (October 20, 2020) https://www.upturn.org/work/mass-extraction/.

[208] Anya E.R. Prince, *Location as Health*, 21 HOUS. J. HEALTH L. & POL'Y 43 (2021); Joseph Cox, *Data Broker is Selling Location Data of People Who Visit Abortion Clinics,* Vice (May 3, 2022) https://www.vice.com/en/article/m7vzjb/location-data-abortion-clinics-safegraph-planned-parenthood.

[209] Lil Kalish, *Meet Abortion Bans' New Best Friend - Your Phone,* Mother Jones (February 16, 2022) https://www.motherjones.com/politics/2022/02/meet-abortion-bans-new-best-friend-your-phone/.

[210] Alice Miranda Ollstein and Megan Messery, *Missouri wants to stop out-of-state abortions. Other states could follow.* Politico (March 19, 2022) https://www.politico.com/news/2022/03/19/travel-abortion-law-missouri-00018539.

[211] *See supra* note 175.

[212] *See* Ali et al., *supra* note 151 (finding that 42% of the 90 apps included in the sample "allowed users to share their tracked information with others, i.e. their doctor, partner, or anyone else").

[213] *But see* Rhonda Zwingerman, Michael Chiakof, & Claire Jones, *A Critical Appraise of Menstrual Tracking Apps for the iPhone,* 42 J. OBSTETRICS AND GYNAECOLOGY CANADA 5 (May 2020) (finding no statistically significant difference in app quality scores between paid and free apps).

[214] Natural Cycles, signup.naturalcycles.com (listing the annual subscription price as $89.99); Basal Thermometer from Natural Cycles https://www.naturalcycles.com/shop/basal-thermometer-fahrenheit. Data about Clue's pricing is not yet available.

personal sovereignty.[215] Looming on the horizon are even more terrifying possibilities. Faced with fewer options for hormonal birth control, the use of period and fertility tracking apps as a form of contraception—as well as unintended pregnancies—may only increase. The data they contain could then, in turn, be used to support criminal and civil actions against pregnant people or those assisting in an abortion. Apps would ensure that people are "good reproductive citizens,"[216] and the data they contain would support or refute whether a person did "everything in [their] power to ensure that [they'd] have a healthy baby."[217] And while this possible dystopia is not a foregone conclusion, current laws and regulations are ill-equipped to stop it.

B. Regulatory & Legal Shortcomings

Despite a growing body of scientific literature and popular press attention to the dangers of period and fertility trackers, the current regulatory and legal environment does little to remedy the problems of accuracy, privacy, and consumer understanding. That is not to say it does nothing at all. But incomplete regulatory solutions and concerning legal trends may create the illusion of protection while simultaneously exacerbating the problems that over-reliance on these products and the harvesting of their data can create.

1. Regulatory Gaps

Considering how the FDA and FTC have investigated and taken action against period and fertility tracking app developers reveals the core shortcomings of these approaches. First, current regulations are reactive, occurring only after apps have already harmed consumers. Second, the FDA and FTC presently intervene on a case-by-case basis, making meaningful market-wide changes impossible. These inadequacies leave consumers vulnerable.

The FDA has authority over apps that qualify as medical devices, including apps intended to diagnose, cure, mitigate, treat, or prevent disease without depending on the body's own metabolism.[218] The definition of device notably excludes any health apps intended to

[215] IT for Change, Feminist Digital Justice, *Data Subjects in the Femtech Matrix: A Feminist Political Economy Analysis of the Global Menstruapp Market,* Issue Paper 6, at 8 (December 2021).

[216] *See supra* notes 112-17.

[217] *See supra* note 79.

[218] 21 U.S.C. § 321(h).

maintain or encourage a healthy lifestyle.[219] This authority includes the ability to require pre-market notification[220] and approval,[221] implement quality system regulation,[222] and request post-market studies.[223] Recall that the FDA regulates some period and fertility trackers as software as contraception, but to date, only two apps have obtained clearance for marketing as contraception.[224] The FDA exercises enforcement discretion over proceptive apps, which comprise the rest of the market, and these apps are only investigated after complaints to ensure that design, marketing, and other statements do not trip the exemptions.[225]

If the FDA's investigation reveals potentially inappropriate marketing in violation of the Federal Food, Drug & Cosmetic Act (FDCA), FDA can send letters to industry asking a developer to change its marking or submit for clearance or approval.[226] Often this is sufficient. But anyone—including app developers—could theoretically challenge or ignore FDA rules, letters, or guidance.[227] If this happens, the FDA has little of its own muscle other than sternly worded communication, beyond which the FDA must convince the Department of Justice to litigate.[228] A tall order for a department with competing legal and political priorities.[229]

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[219] 21 U.S.C. §360j(o)(1)(A)-(E)) (The 21st Century Cures Act also excludes four other types of apps from the definition of medical device, including those that provide administrative support for a health care facility; serve as electronic patient records; transfer, store, or display data for converting data formats; and provide limited clinical decision support).

[220] 21 C.F.R. Part 807 Subpart E.

[221] 21 C.F.R. Part 814.

[222] 21 C.F.R. Part 820.

[223] *Postmarketing Requirements and Commitments: Legislative Background*, U.S. FOOD & DRUG ADMIN. https://www.fda.gov/drugs/postmarket-requirements-and-commitments/postmarketing-requirements-and-commitments-legislative-background (last updated June 14, 2018).

[224] *See supra* notes 131-38.

[225] *See supra* notes 143-45.

[226] U.S. FOOD AND DRUG ADMINISTRATION, *Letters to Industry* https://www.fda.gov/medical-devices/industry-medical-devices/letters-industry.

[227] C. Joseph Ross Daval, *Litigating Authority for the FDA,* Wash. U. L. Rev (Forthcoming 2022) https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4046934 at 4.

[228] 28 U.S.C. § 516 (2018) ("Except as otherwise authorized by law, the conduct of litigation in which the United States, an agency, or officer thereof is a party, or is interested, and securing evidence therefore, is reserved to officers of the Department of Justice, under the direction of the Attorney General."); 28 U.S.C. § 519 (2018) ("Except as otherwise authorized by law, the Attorney General shall supervise all litigation to which the United States, an agency, or officer thereof is a party . . ."); 5 U.S.C. § 3106 (2018) ("Except as otherwise authorized by law, the head of an Executive department . . . may not employ an attorney or counsel for the conduct of litigation . . . but shall refer the matter to the Department of Justice."); John R. Fleder, *The Role of the Department of Justice in Enforcement Matters Relating to the Food and Drug Administration,* 46 FOOD, DRUG, COSMETIC L. J. 6 (1991) (describing the DOJ's role in FDA enforcement actions).

[229] *See supra* note 227 (finding that "DOJ control of FDA litigation in fact shapes FDA policy, with the interview responses centering around three main themes. First, DOJ's final say-so limits FDA's preferred implementation of the Food, Drug, and Cosmetic Act (FDCA), the main statute

Though the FDA could theoretically consider any relevant source of information when determining a product's intended use,[230] for now, the FDA is primarily concerned with "labeling claims, advertising materials, or oral or written statements by a manufacturer or their representative."[231] But just because an app developer and the FDA do not believe marketing and design evince that a product is intended to be used as contraception does not mean a consumer will agree. In fact, consumers may regularly use proceptive apps as contraception.[232] Before obtaining FDA clearance via the 510(k) approval pathway, *Clue* market research revealed that 20% of consumers already used *Clue's* app for contraceptive purposes even though they did not advertise this functionality.[233] Given that consumer health apps lack even the modest protections of having a physician intermediary that might otherwise be present for prescription pharmaceuticals and other medical devices used as part of medical care, the FDA's current approaches are ineffective at regulating proceptive apps, leaving most apps untouched and permitting consumer misperceptions and misuse to persist.

But policing period and fertility tracking apps is not solely the FDA's responsibility. The FDA shares oversight of health apps with the FTC, but each focus on separate conduct.[234] The FTC's mission includes protecting consumers and promoting competition, which includes regulating privacy, security, and health claims in advertising. [235] Under Section 5 of the FTC Act, the FTC regulates unfair and deceptive acts or practices.[236] Under Section 12-15, the FTC prohibits disseminating any false or misleading advertisement.[237] The FTC requires that claims in advertising are "truthful, cannot be deceptive or unfair, and must be

FDA is tasked with administering. Participants described how DOJ sometimes declined to pursue FDA cases, or delayed filing them. The agencies regularly disagree over what kinds of arguments to make, whether to appeal adverse judgments, and other litigation decisions. Furthermore, the expectation of DOJ review shapes FDA referrals to align more with DOJ priorities." And "the agencies have distinct enforcement priorities. Although there is overlap, FDA tends to prioritize health and safety violations, while DOJ tends to favor promotional cases, such as prosecutions for illegal marketing of drugs and devices for indications not approved by FDA ("off-label" promotion)").

[230] 86 Fed. Reg. 41383 (Aug. 2, 2021).

[231] *See supra* note 145.

[232] Darius Tahir, *Fertility Tracking Apps: Popular, Hyped—and Often Inaccurate,* POLITICO (July 20, 2019 at 12:15PM EDT) available at https://www.politico.com/story/2019/07/10/fertility-tracking-apps-popular-hyped-and-often-inaccurate-1563598.

[233] *See supra* note 159.

[234] Solomon Center for Health Law and Policy at Yale Law School and Strathmore Health Strategy, *A Path to Patient-Centered Digital Health Regulation* (Ryan Knox and Cara Tenenbaum, eds.) (July 2021), 9.

[235] *What We Do*, FEDERAL TRADE COMMISSION, https://www.ftc.gov/about-ftc/what-we-do (last visited May 9, 2021).

[236] 15 U.S.C. § 45.

[237] 15 U.S.C. §§ 52-55.

evidence-based."[238] Section 13(b) authorizes the FTC to file suit to enjoin an act or practice that violates these provisions.[239]

The FTC can even engage in rulemaking, albeit a burdensome and difficult process.[240] In fact, the ability of the FTC, or any agency, to regulate through rulemaking has been made more difficult with the Supreme Court's ruling in *West Virginia v. Environmental Protection Agency*.[241] Here the Court ushered in the era of the "major questions doctrine," which limits agency power to act in areas of "economic and political significance" unless Congress clearly grants such authority.[242] Thus, at first blush, the FTC appears well-positioned to improve both efficacy and privacy in the period and fertility tracking app market and perhaps already on its way to meaningful change. But, much like the FDA, FTC's approaches in the femtech space are currently reactive and limited to addressing *reported* violations on a case-by-case basis.

An example illustrates how the FTC can protect menstrual data.[243] In 2021, the FTC brought a case against Flo Health Inc., developer of the popular period and fertility tracking app *Flo*, for breaking privacy promises to consumers.[244] Specifically, *Flo* used third-party tools called software development kits that gathered user advertising and unique identifier data.[245] This user data included descriptive "custom app events," primarily used to improve app functionality.[246] But these custom app events also revealed menstruation, fertility, and pregnancies.[247] By allowing the third-party software development kits to gather the custom app events, *Flo* violated its statement that it would never share any data related to health.[248]

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[238] Federal Trade Commission Advertising and Marketing Basics, FEDERAL TRADE COMMISSION, https://www.ftc.gov/tips-advice/business-center/advertising-and-marketing (last visited May 9, 2021).

[239] *See supra* note 237, at § 53.

[240] 15 U.S.C. § 57a (2018); Magnuson-Moss Warranty-Federal Trade Commission Improvement Act Pub. L. No. 93-637, 88 Stat. 2183 (1975).

[241] 142 S.Ct. 2587 (2022).

[242] *Id*. at 2608.

[243] State attorneys general can also protect consumers in similar ways. See e.g., Press Release, Att'y Gen. of Cal., Attorney General Becerra Announces Landmark Settlement Against Glow, Inc. – Fertility App Risked Exposing Millions of Women's Personal and Medical Information (Sept. 17, 2020), https://oag.ca.gov/news/press-releases/attorney-general-becerra-announces-landmark-settlement-against-glow-inc-%E2%80%93.

[244] In the Matter of Flo Health, Inc, https://www.ftc.gov/system/files/documents/cases/flo_health_complaint.pdf.

[245] *Id*.

[246] *Id*.

[247] *Id*.

[248] *Id*.

Further, *Flo* did not limit what these third-party companies could later do with the health data they obtained.[249]

Importantly, the issue here was not that *Flo* shared health data. As described above, period and fertility tracking apps share data all the time.[250] The problem was that *Flo* broke a promise to consumers. If *Flo* had disclosed and used different language to describe its third-party data-sharing practices with consumers, this type of data sharing would be perfectly legal.[251] This is because, even though many believe the law affords health data special protections because of their sensitive nature, it often does not. For example, data in most consumer health apps are not generally entitled to the privacy and security assurances we expect in other health contexts, like those involving the Health Insurance Portability and Accountability Act (HIPAA).

In theory, the FTC's new aggressive approach to the Health Breach Notification Rule (HBNR) could prove useful in filling this health data privacy gap.[252] The HBNR applies to certain businesses and nonprofits not covered by HIPAA.[253] It requires those organizations to notify their customers, the FTC, and, in cases involving more than 500 people from one state, the media if there is a breach of unsecured, individually identifiable health records.[254] The HBNR is relevant to period and fertility tracking apps for at least two reasons. The first is that it defines a "personal health record" as any health record that can be "drawn from multiple sources and that is managed, shared, and controlled by or primarily for the individual."[255] So, for example, a period tracking app that combines calendar data with a user's menstrual data is likely a personal health record.[256] The second is that the FTC intends to interpret the term "breach" to mean both hacking as well as a company's disclosure of covered information without the person's authorization.[257] Here, some privacy experts believe the FTC's

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[249] *Id.*

[250] *See supra* note 172.

[251] *See supra* note 185.

[252] U.S. Federal Trade Commission. *Complying with the FTC's Health Breach Notification Rule*. https://www.ftc.gov/tips-advice/business-center/guidance/complying-ftcs-health-breach-notification-rule (2022).

[253] Theoretically a company could be subject to both HIPAA and the HBNR. The FTC provides an example of a company that is a HIPAA business associate that also offers personal health record services to the public. *Id.*

[254] *Id.*

[255] 16 C.F.R. § 318.2(d) (defining "personal health record").

[256] The FTC website gives the example of a diet app that allows users to enter daily weights and an API for pulling calorie counts from restaurant menus as an example of a covered personal health record. U.S. FEDERAL TRADE COMMISSION, *supra* note 252.

[257] *See supra note* 255, at § 318.2(a) (defining "breach of security"); U.S. FEDERAL TRADE COMMISSION, *supra* note 252.

issue in the *Flo* case—that the developer promised not to share and then did—counts as a breach.[258]

While the HBNR is good, it is not perfect. The HBNR does not establish privacy or security standards like HIPAA does, nor does it prohibit third-party data sharing. All it does is passively promote encryption and incentivize developers to write privacy marketing and policies that accurately reflect privacy practices. And, if law enforcement is involved and determines that notification would impede a criminal investigation, the Rule would permit delaying any notifications—to the media, the FTC, and even the impacted individual.[259] Thus, the HBNR may prove ineffective everywhere to address the privacy harms this Article contemplates but completely impotent in states with the most expansive criminalization of abortion and pregnancy-related behaviors. For a motivated municipality, like so-called "sanctuary cities for the unborn,"[260] avoiding notification requirements for an entire town is just a warrant away.

Though the FDA and the FTC appear to have the necessary tools to police the period and fertility tracking app market, they fall short because, at least for now, they look at apps individually and reactively, if at all. While fixing any problem is still important, subsequent incremental improvements will mean little to people who have already become pregnant in a world with increased surveillance, control, and punishment. And given resource limitations and other constraints, relatively few apps will ever be scrutinized by the FDA or FTC.[261] As a result, consumers who have not yet been harmed will face a market saturated with apps that have significant accuracy, privacy, and consumer deception problems, and current regulatory approaches will leave consumers to navigate this minefield alone.

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[258] Julia Kadish, National Law Review, *FTC Continues to Signal Interest in Digital Health Industry, Publishing Updated Resources* (March 15, 2022) https://www.natlawreview.com/article/ftc-continues-to-signal-interest-digital-health-industry-publishing-updated.

[259] *See supra* note 252.

[260] Harmeet Kaur, *Small Towns in Texas Are Declaring Themselves 'Sanctuary Cities for the Unborn'* CNN (January 25, 2020) https://www.cnn.com/2020/01/25/us/sanctuary-cities-for-unborn-anti-abortion-texas-trnd/index.html.

[261] UNITED STATES FEDERAL TRADE COMMISSION, REMARKS OF COMMISSIONER REBECCA KELLY SLAUGHTER, FTC Health #12, *the FTC's Approach to Consumer Privacy*, (April 10, 2019) https://www.ftc.gov/system/files/documents/public_statements/1513009/slaughter_remarks_at_ftc_approach_to_consumer_privacy_hearing_4-10-19.pdf.

2. Constitutional Obstacles

The law may prove similarly ineffective in protecting consumers of period and fertility trackers. For example, one obvious proactive option for the government is to require a label. A warning label could raise consumer awareness about lack of efficacy for use as birth control and potential privacy risks. Mandating warnings of factual information about a product is a classic public health regulation that is purely informational, maintaining individual autonomy and choice while placing minimal burdens on the manufacturer. This approach could limit the impact of an app hiding pertinent information under a lengthy and unwieldy terms of use agreement or privacy policy or simply omitting it. It could also produce more equitable protection by minimizing the need for high levels of health and digital literacy. Reports indicate that the Biden Administration is interested in asking the FTC to "push makers of apps that track menstrual cycles to warn users that the data could be used to identify women in the early stages of pregnancy."[262] But a mandated label's chances of withstanding legal challenges are increasingly unlikely.

Speech restrictions applied to commercial products typically fall under the category of commercial speech. Historically, the law afforded commercial speech fewer protections than standard speech—even no protection at all for much of the country's history.[263] Over time, the Court recognized that commercial speech is important for consumers to make informed decisions and began to apply some First Amendment protections.[264]Now, courts evaluate commercial speech regulations under one of two tests: the Zauderer test or the Central Hudson test.[265] The Zauderer test is the least stringent, typically applying when the government mandates accurate information that simply informs consumer decision-making.[266] Central Hudson is a more exacting scrutiny because it evaluates a commercial speech regulation that stems from a government viewpoint that the product or service is

[262] Charlie Savage, *Bracing for the End of* Roe v. Wade, *the White House Weighs Executive Actions,* The New York Times (June 16, 2022) https://www.nytimes.com/2022/06/16/us/politics/biden-abortion-roe-v-wade.html.

[263] Virginia State Board of Pharmacy v. Virginia Citizens Consumer Council, 425 U.S. 748, 765 (1976).

[264] *Id.* at 765 (1976) ("Advertising, however tasteless and excessive it sometimes may seem, is nonetheless dissemination of information as to who is producing and selling what product, for what reason, and at what price."). "It is a matter of public interest that those decisions, in the aggregate, be intelligent and well informed. To this end, the free flow of commercial information is indispensable." *Id.*

[265] RJ Reynolds Tobacco v. FDA, 696 F.3d 1205, 1212 (2012).

[266] Zauderer v. Office of Disciplinary Counsel, 471 U.S. 626 (1985).

harmful or risky.[267] However, the distinction between purely factual and government viewpoint has blurred in recent years, with the Court finding a government viewpoint more often, more skeptical of government interests, and more stringent about what qualifies as accurate information.

Take, for example, the FDA's graphic warning labels for cigarettes, issued under a mandate from Congress in the Tobacco Control Act.[268] In upholding the labels, the Sixth Circuit determined the warnings did "not impose any restriction on Plaintiffs' dissemination of speech" and did not "touch upon Plaintiffs' core speech."[269] Instead, the court held that the labels served as disclaimers to the public regarding the "*incontestable* health consequences of using tobacco."[270] Yet, the D.C. Circuit struck down the warning labels as "ideological" and "subjective."[271] This determination moved the analysis from Zauderer to Central Hudson, where the court, under the more stringent standard, required definitive evidence that the warning labels would reduce smoking rates.[272]

Beyond requiring a more stringent test, some of the dicta in the D.C. Circuit's opinion raise ominous questions about the limits of compelling any warning labels. For example, the court questioned whether the government could compel speech that would undermine a company's economic interests.[273] Yet, warnings are always about some potential risk and thus will dissuade some number of consumers. This creates serious doubt about the constitutionality of all warning label requirements on lawful products, especially considering the court also questioned the legitimacy of a state's interest in discouraging consumers from using a lawful product even if there are clear adverse health impacts.[274] For period and fertility tracking apps, any type of requirement, be it from the state or federal government, mandating that a developer disclose that a product is neither effective—or at least has not been proven effective—as contraception or that it sells user data would almost certainly hit a developer's financial bottom line.

In *National Institute of Family Life Advocates v. Becerra*, the Supreme Court raised even more doubt about how warning labels for period and fertility apps would fare.[275] This case concerned Crisis

[267] Central Hudson Gas & Electric Corp. v. Public Service Commission, 447 U.S. 557 (1980).
[268] Pub. L. No. 111-31, 123 Stat. 1778 (2010).
[269] 674 F.3d 509, 527 (2012).
[270] *Id.* (emphasis added).
[271] RJ Reynolds Tobacco, 696 F.3d at 1212.
[272] *Id.* at 1213–17.
[273] *Id.* at 1212.
[274] *Id.*
[275] 128 S.Ct. 2361 (2018).

Pregnancy Centers (CPCs), which, by their own admission, present as clinics providing reproductive services so pregnant women will seek their services and staff can convince them not to obtain an abortion.[276] Or, in some cases, CPC staff will purposefully delay consultation to prolong the pregnancy with the hope that abortion will no longer be available.[277] Given this deception, California passed the Reproductive Freedom, Accountability, Comprehensive Care, and Transparency Act. The Act required CPCs to post a notice that California provides free or low-cost services, including abortion; list a phone number for more information; and, where applicable, disclose when a CPC is not licensed to provide medical services.[278]

Despite requiring indisputably factual information, the Court held that the California law violated the First Amendment.[279] The Court reasoned that the mandated disclosure did not require "purely factual and uncontroversial information" because it related to abortion, which is a controversial topic.[280] Never mind that the mandated disclosure hoped to remedy CPCs' well-known deceptive acts.

The *NIFLA* decision is surprising because the fact that a mandated disclosure involves a controversial topic should have no bearing on the analysis. As traditionally applied, Zauderer's use of factual and uncontroversial information pertains to whether the *information* was controversial, not whether it related to a controversial topic.[281] Now, "controversial" takes on new meaning, which does not bode well for the ability of a hypothetical mandated disclosure for period and fertility trackers to survive a legal challenge.[282] While a warning for apps could be seen as directly related to the services they provide, the connection to reproduction—and more importantly, its potential use as contraception or a way to obtain an abortion before restrictions set in—could be seen as "controversial." And, just as CPCs misled to achieve their ideological goals, femtech apps misleading their consumers may not be relevant to the Court.

If this does not lead the Court to strike down a mandated disclosure directly, it could instead apply a Central Hudson analysis.

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[276] Brief of 51 Reproductive Rights, Civil Rights, and Social Justice Organizations as Amici Curiae in Support of Respondents, National Institute of Family Life Advocates v. Becerra, 128 S.Ct. 2361 (2018).

[277] *Id.*

[278] NIFLA, 128 S.Ct. at 2368.

[279] *Id.* at 2378.

[280] *Id.* at 2372.

[281] *Id.* at 2378 (Breyer, J., dissenting).

[282] *See* American Beverage Association v. City of San Francisco, 916 F.3d 749, 761 (9th Cir. 2019) (applying *NIFLA* and striking down a warning about the health dangers of consuming sugar-sweetened beverages in part due to its relation to a "controversial topics.") (Ikuta, J., concurring).

Under this standard, the government must show a substantial interest that the law directly advances and that the restriction on commercial speech is not more extensive than necessary to serve that interest.[283] Again, given the current direction of the judiciary in protecting commercial speech, there are open questions of whether the Court would even find a substantial government interest, let alone that a warning label directly advances it in a way that the government could not achieve with a lesser intrusion. It may be difficult for the government to justify infringing on First Amendment rights to protect users who voluntarily disclose personal information to these apps. With the relative novelty of these apps and the current lack of a warning, it would also be difficult for the government to provide "substantial evidence" that warnings would have a material impact on advancing the government's interest.[284] And, if the government is so concerned, the Court might reason, it is free to educate the public instead of forcing speech that undermines a company's economic interests.[285]

Another limitation of mandated disclosures is the potential connection to religious beliefs. As we saw with *Hobby Lobby* and its progeny, the Court has been willing to protect religious liberty above reproductive rights in cases well beyond abortion. App developers could claim a religious objection to any mandated disclosure because a consumer might use the information to access abortion services or engage in other "immoral" behavior. As we saw in *Hobby Lobby*, mere belief, no matter how tenuous, could be sufficient to trigger religious liberty protections. This type of claim would be even easier to make for apps created by religious institutions.[286]

But the First Amendment is not the only relevant Amendment when considering the unique risks of period and fertility trackers. This is especially true when it comes to privacy and criminalization of abortion and fetal-harming behaviors. While the Fourth Amendment protects against arbitrary or unreasonable searches and seizures, the pertinent question is typically whether there was a reasonable expectation of privacy.[287] Part of the problem with expecting Fourth Amendment protection lies in how reasonableness is tied to history.[288] Since *Dobbs* declares no historical right to abortion and courts can apply similar reasoning to contraception,[289] it would be difficult to argue for a

[283] RJ Reynolds Tobacco, 696 F.3d at 1217.
[284] *Id.* at 1219 (dismissing international data demonstrating potential effectiveness).
[285] NIFLA, 128 S.Ct. at 2367.
[286] *See supra* note 10.
[287] Katz v. United States, 389 U.S. 347, 351 (1967).
[288] Carpenter v. United States, 138 S.Ct. 2206, 2214 (2018).
[289] *See supra* note 193 and accompanying text.

historically supported expectation of privacy for the reproductive information these apps contain.

Meanwhile, third-party doctrine likely limits app user privacy rights. In *United States v. Miller*, the Supreme Court held the government did not violate the Fourth Amendment when it obtained bank documents for an investigation of tax evasion.[290] According to the Court, because Miller shared his information with the bank, he assumed the risk that this information might later be shared with the government.[291] The Court reaffirmed this stance in *Smith v. Maryland* when it found that phone company consumers have no expectation of privacy in the phone numbers they dial.[292] It follows, then, that users of period and fertility tracking apps will have a difficult time claiming a reasonable expectation of privacy when they are voluntarily sharing their private information with a third party. This distinguishes the case of surveillance of app data from recent cases where the Court limited the ability to use digital information.[293]

In *Riley v. California*, the Supreme Court declined to extend the exception for warrantless searches incident to arrest to include the entire contents of a cell phone.[294] Despite the arrestee having expired registration tags, a suspended license, two loaded handguns, and items associated with the "Bloods" street gang, the Court held that cell phone data differentiated the search from prior cases because of the "vast quantities of personal information" on a cell phone.[295] The Court reasoned similarly in *Carpenter v. U.S.*, where it held that the third-party doctrine did not apply to cell phone location data because it considered it "qualitatively different."[296] The Court distinguished between "dialed digits" and a "comprehensive record of the person's movements."[297] But these cases include extensive cell phone data involuntarily obtained by law enforcement incident to arrest. Indeed, *Carpenter* involved "unique" cell phone location data "*held* by a third party" not voluntarily given to an app the user chose to download and input data into regularly.[298] And while the *Ferguson* case described in Part IA does not involve cell phone data, its mention in the *Dobbs* oral

[290] 425 U.S. 435, 440 (1976).

[291] *Id.* at 443.

[292] 442 U.S. 735, 742–43 (1979).

[293] *See* Riley v. California 134 S.Ct. 2473, 2485 (2014) (requiring a search warrant to search data on cell phones after an arrest) and Carpenter v. United States, 138 S.Ct. 2206, (2018) (holding cell-site location information did not qualify under third-party doctrine).

[294] Riley, 134 S.Ct. at 2485.

[295] *Id.* at 2480–85.

[296] Carpenter, 138 S.Ct. at 2216–17.

[297] *Id.* at 2217.

[298] *Id.*

argument could suggest its relevance. But despite the Court finding a Fourth Amendment violation in *Ferguson*, it was the implementation of a warrantless search program for law enforcement purposes that was central to the outcome. In the case of period and fertility tracking apps, the distinguishing characteristic remains the voluntary provision of data, which eliminates the expectation of privacy. Thus, these cases demonstrate why the Fourth Amendment is unlikely to help users of period and fertility tracking apps.

III. A DIFFERENT FUTURE FOR FEMTECH

In theory, period and fertility trackers could offset some of the worst possible limitations of reproductive freedoms. But the same characteristics that give these apps so much promise—their popularity, affordability, ease of uptake, data, and predictions—also create significant risks in the current regulatory and legal environment. It would be naive to claim one neat solution is up to the task of solving a problem as enormous as the one identified in this Article, especially when the only real solution is to avoid creating the need for a reproductive surveillance state in the first place. This Part begins with mandated solutions but discounts them as realistic standalone possibilities in light of political, legal, and logistical realities. It then turns to voluntary solutions that, though not as far-reaching, could influence beneficial market behaviors and augment federal initiatives.

A. The Difficulty of Mandating Change

Hands-off approaches to consumer health technologies have fostered conditions that harm consumers. While some states provide more comprehensive consumer protections than others, and some developers offer higher-quality products, ineffective and insecure apps predominate the market. This subpart identifies ways to ensure uniform changes to accuracy, privacy, and consumer understanding but cautions that they are imperfect solutions to the complex problem of protecting and promoting reproductive rights.

1. Efficacy

The best way to improve product efficacy and reduce market size is to change the FDA's regulatory approach. Recall that the FDA currently regulates software as contraception as a Class II device and exercises enforcement discretion over the proceptive apps that

dominate the market.[299] To date, the FDA has primarily looked at marketing and advertising information to determine if contraception is an app's "intended use."[300] Moving forward, the FDA should look more broadly to determine if a product is intended to be used as contraception.[301] For example, the FDA could consider subjective claims[302] and product design.[303] It could even look at what the environment and context convey between a buyer and a seller.[304] By expanding what it considers evidence of intended use, the FDA could theoretically regulate more—perhaps all—proceptive apps as contraception.

Further, instead of regulating software as contraception as a Class II device, the FDA could reclassify them as Class III due to their "similarity to existing contraceptive devices, reliance on user input, and demonstrated need for more robust clinical efficacy standards."[305] Class III devices are the highest risk and generally require premarket approval (PMA).[306] The classification applies to devices that are "of substantial importance in preventing impairment of human health" or those that "present a potential, unreasonable risk of illness or injury."[307] By reclassifying software as contraceptives as Class III, the FDA would require PMA, necessitating, among other things, non-clinical laboratory studies and clinical investigations to ensure safety and efficacy.[308]

Though possible, this type of FDA reform would encounter significant if not insurmountable hurdles, including resource limitations and lack of meaningful leverage over app developers. But perhaps the most significant is the Court's ruling in *West Virginia v. Environmental Protection Agency*, which struck down an EPA rule

[299] *See supra* notes 131-45.

[300] *See supra* note 230.

[301] *Id.*

[302] Nat'l Nutritional Foods Ass'n v. FDA, 504 F.2d 761, 789 (2d Cir. 1974) ("[A] factfinder should be free to pierce all of a manufacturer's subjective claims of intent . . . to find actual therapeutic intent on the basis of objective evidence . . .").

[303] *See, e.g.*, Clarification of When Products Made or Derived from Tobacco Are Regulated as Drugs, Devices, or Combination Products; Amendments to Regulations Regarding "Intended Uses," 82 Fed. Reg. 2193, at 2208 (Jan. 9, 2017) (providing examples of when the FDA has relied on product design as circumstantial evidence of intended use).

[304] United States v. Travia, 180 F. Supp. 2d 115, 119 (D.D.C. 2001) ("the environment provided the necessary information between buyer and seller").

[305] Alexandra M. Taylor, *Fertile Ground: Rethinking Regulatory Standards for Femtech*, 54 UC DAVIS L. REV. 2267, 2287-92 (2021).

[306] See 21 U.S.C. § 360(c) (2012). (Class I are the lowest risk and subject to the least regulatory control; Class II are an intermediate level of risk).

[307] PMA Approvals, U.S. FOOD & DRUG ADMIN., https://www.fda.gov/medical-devices/premarket-submissions-selecting-and-preparing-correct-submission/premarket-approval-pma.

[308] See generally 21 CFR § 814 (premarket approval of medical devices); 21 CFR § 814.20 (describing components of the application).

under the Clean Air Act shifting energy to clean power sources to reduce carbon emissions.[309] The seemingly clear connection between reducing carbon emissions from coal-powered plants into the air and the authorizing Clean Air Act was less important to the Court than the rule's "economic and political significance."[310] Applying the Court's reasoning to apps, the FDA's authority to regulate period and fertility tracking apps—as opposed to food or drugs—is even less clear than in the EPA's case, and the issue undoubtedly relates to a significant political and economic issue.[311] So while the risks period and fertility tracking apps pose in a post-*Dobbs* world may incentivize different FDA action, the Court's pronouncement of the "major questions doctrine" limits agency authority to respond to emerging threats not explicitly contemplated and directed to address in Congressional statute.[312] Especially since the definition of medical devices is for products "intended for use in the diagnosis of *disease or other conditions,* or in the cure, mitigation, treatment, or prevention of *disease*," one might argue that pregnancy and menstruation are neither diseases nor conditions.[313] Indeed, Congress's more recent exemption of health apps intended to maintain or encourage a healthy lifestyle from the definition of device in the 21st Century Cures Act[314] could lead the Court to determine that Congress specifically rejected the FDA's authority to regulate period and fertility tracking apps at all.[315]

But even if the FDA is able to regulate in this space—now quite a big if—there are reasons to be skeptical about the substantive impact we can expect. A key issue is that the FDA lacks the necessary leverage to enforce these changes beyond sternly worded letters to industry. And given that past performance is probably the greatest indicator of future action, there is little reason to believe the FDA would be interested in a

[309] West Virginia v. EPA, 142 S.Ct. 2587, 2587 (2022).

[310] *Id.* at 2608.

[311] *See e.g.*, Texas v. Becerra, State of Texas's Original Complaint (July 14, 2022) (N.D. TX 2022) (citing *West Virginia v. EPA* for the proposition that EMTALA cannot be enforced by HHS with regard to abortion because it is a "major question of 'deep and political significance' that Courts will not assume Congress has assigned the Executive Branch" and "Congress intends to make major policy decisions itself, not leave those decisions to agencies.").

[312] West Virginia, 142 S.Ct. at 2613 (stating that the connection between the EPA's actions and reducing air pollution was not persuasive). For instances of "economic and political significance" the Court now requires "clear congressional authorization." *Id.* at 2614.

[313] *See supra* note 218, at § 321(h)(1)(B).

[314] 21st Century Cures Act. H.R. 34, 114th Congress. 2016.

[315] West Virginia, 142 S.Ct. at 2614 ("We cannot ignore that the regulatory writ EPA newly uncovered conveniently enabled it to enact a program that, long after the dangers posed by greenhouse gas emissions 'had become well known, Congress considered and rejected' multiple times.").

more hands-on approach to the "low-risk" health app industry,[316] much less something as contentious and now politically charged as period and fertility trackers.

Importantly, at least one period and fertility tracking app developer has already defied FDA warning letters and proven itself litigious. This creates the real possibility for a challenge to the FDA's authority to regulate this entire product category and demonstrates clear opposition to good-faith participation in the scientific process that the FDA would require to establish evidence-based apps through heightened regulatory scrutiny.

Consider *Valley Electronics AG v. Polis.*[317] In this case, a group of researchers funded by Valley Electronics AG published a study showing that using their Daysy fertility monitor—especially when combined with the DaysyView App—could be used for both conception and contraception at rates higher than previously reported.[318] The company used the study's findings to advertise 99.4% effectiveness at preventing pregnancy on social media.[319]

But there were problems with the study, and a researcher called for a retraction citing deficiencies in the standard effectiveness calculations and other methodological concerns.[320] After the retraction,[321] the researcher shared her findings, acknowledging that the lay public rarely reads scientific studies and hoping to counter the effect of Valley's marketing. In response, Valley filed a defamation lawsuit, concerned not only with the researcher's scientific assertions but her opinions and commentary, including statements she made on social media, to reporters, and on her blog.[322] A federal judge threw out the case,[323] but Valley appealed.[324] In 2022, the appellate court affirmed the judgment, concluding that the researcher's statements were nonactionable opinions.[325]

This dispute might initially read as frivolous, and, from a legal standpoint, it is. However, the power of defamation cases is not in who

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[316] The FDA initiated and then abandoned a pre-certification program for app developers. It continues to revise industry guidance, taking an increasingly hands-off approach to regulation.

[317] Valley Electronics AG v. Polis Original Complaint 1:20-cv-02133.

[318] *See supra* note 156

[319] *See supra* note 158.

[320] *Id.*

[321] *See supra* note 157.

[322] Kate Sheridan & Casey Ross, *In a defamation lawsuit, the hype around digital health clashes with scientific criticism,* STATNEWS (March 2, 2022) available at https://www.statnews.com/2022/03/02/health-fertility-thermometer-valley-polis/.

[323] *Valley Electronics AG v. Polis,* district court 1:20-cv-02133.

[324] *Valley Electronics AG v. Polis,* 2nd Circuit Ct App 1:20-cv-02133.

[325] *Id.*

ultimately wins but in the threat of protracted legal battles.[326] Experts warn that lawsuits like this can make scientific criticism less likely.[327] And this chilling effect calls into question not only the ability of heightened FDA scrutiny to protect consumers from inaccurate apps but the scientific community's continued willingness to raise awareness about the problem. It also represents a scenario that we fear will become more common if regulators begin to require more scientific evidence. And an app developer that vigorously defends its product in court may eventually turn to the regulator itself, emboldened by the growing chinks in the armor of the administrative state.

2. Privacy and Security

The outlook for privacy and security is similarly bad. Though the health-related data contained in period and fertility tracking apps seems like it should somehow be entitled to the standards and protections we expect in other sensitive health contexts, it is generally not. Here, the post-*Dobbs* criminalization of abortion and pregnancy-related behaviors limits the ability of privacy and security law to prevent the reproductive surveillance contemplated by this Article.

At first blush, one might think it could be advantageous to reform HIPAA to protect menstrual and pregnancy data with its privacy and security standards. In fact, scholars have already suggested such measures specifically in light of the unique risks that period and fertility trackers pose.[328] Reforming HIPAA also has broad bipartisan support. For example, the Health Data Use and Privacy Commission Act, introduced in February 2022, acknowledges the deficiencies in health technology and app governance and would establish a commission to study and recommend changes to health information privacy laws.[329] Those modifications could extend the scope of HIPAA beyond covered entities and business associates to include some or all consumer health technologies. But though consensus says HIPAA is due for modernization, meaningful momentum has yet to materialize.

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[326] Lawsuits like this are also referred to as "Strategic Lawsuits Against Public Participation" (SLAPP). They are not intended to prevail on the merits, but to harass and financially pressure defendants and quash constitutional rights. Some states, but not all, have anti-SLAPP laws.

[327] *See supra* note 322.

[328] Celia Rosas, *The Future is Femtech: Privacy and Data Security Issues Surrounding Femtech Applications,* 15 HASTINGS BUS. L. J. 2, 335-37 (2019); Allysan Scatterday, *This is No Ovary-Action: Femtech Apps Need Stronger Regulations to Protect Data and Advance Public Health Goals,* 23 NC J. L. & TECH. 3 (2022).

[329] S. 3620 117th Congress 2D Session.

The FTC could theoretically bring enforcement actions against more period and fertility tracking apps for unfair or deceptive acts or practices, but this avenue is similarly unlikely given how the FTC works. And addressing apps on a case-by-case basis is unlikely to change the entire market. No matter how aggressively the FTC enforces the HBNR, it does nothing to help prevent breaches from occurring in the first place or address the matter of law enforcement exceptions. Further, the FTC does not currently establish normative privacy standards or require privacy policies.[330] It could, but it would require rulemaking, which is a complex and years-long process, and the fruits of that labor are now increasingly suspect under the "major questions doctrine."[331] Thus, nothing the FTC does in the short term will meaningfully protect consumers of period and fertility trackers, even though they have expressed a firm commitment to keeping a close eye on technologies that contain reproductive health information.[332]

Aiming even higher than major reforms to HIPAA or improved FTC oversight would likely prove insufficient for consumers who are most at risk. Imagine something as sweeping as the European Union's General Data Protection Regulation (GDPR). While the GDPR confers significantly greater privacy protections than current U.S. law, it is not a panacea.[333] European countries that are highly motivated to develop digital health evaluation and relatively far along in operationalizing their frameworks continue to struggle with implementation.[334] Research is beginning to expose that heightened legal data protections via legislation do not always translate to improved data protection on the ground.[335] And even in countries where the GDPR is in place,

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[330] Jessica Rich, *Give the F.T.C. Some Teeth To Guard Our Privacy*, THE NEW YORK TIMES (August 12, 2019), https://www.nytimes.com/2019/08/12/opinion/ftc-privacy-congress.html; *See also* Solomon Center Report, *supra* note 234, at 34.

[331] Section 5 of the FTC Act empowers the FTC to engage in rulemaking to regulate unfair and deceptive acts or practices. 5 U.S.C. § 57a. *But see* West Virginia v. EPA, 142 S.Ct. 2587 (2022) (concerning an EPA rule initially passed in 2015 that was never put into place before being struck down by the Court seven years later).

[332] Kristin Cohen, *Location, Health, and Other Sensitive Information: FTC Committed to Fully Enforcing the Law Against Illegal Use and Sharing of Highly Sensitive Data*, FEDERAL TRADE COMMISSION BUSINESS BLOG (July 11, 2022) https://www.ftc.gov/business-guidance/blog/2022/07/location-health-other-sensitive-information-ftc-committed-fully-enforcing-law-against-illegal-use.

[333] IRISH COUNCIL FOR CIVIL LIBERTIES, *The Biggest Data Breach* (May 2022) (exposing the risks of Real-Time Bidding and finding that People in the US have their online activity and real-world location exposed 57% more often than people in Europe).

[334] Anna Essen, Ariel D. Stern, Christoffer Bjerre Haase, Josip Car, et. al. *Health App Policy: International Comparison of Nine Countries' Approaches,* npj DIGITAL MED. 5:31 (2022).

[335] Martin Tisne and Marietje Schaake, *The data delusion: Protecting individual data is not enough when the harm is collective*; *See also* Shipp and Blasco, *supra* note 96 (finding that that none of the apps included in the study "were able to provide the necessary information on all

popular period and fertility tracking apps fail to protect the legal rights of their consumers.[336]

Other options exist. For example, scholars have proposed a duty of loyalty for companies that process consumer information,[337] special protections for intimate information that limit its collection and use and provide remedies for victims,[338] and even more aspirational reforms inspired by intersectional feminist perspectives.[339] To the extent law and regulation can bring about these changes, we believe they should. But in states that criminalize reproductive choices—through either criminal statutes or civil enforcement such as SB8—these approaches will fail. Privacy laws—including the My Body, My Data Act, drafted with *Dobbs* and menstruation tracking at the forefront—contain glaring exceptions for law enforcement,[340] subpoena and discovery requests, and inevitably run up against the need to balance individual privacy interests with the very real security risks of "going dark."[341] So long as the government retains the ability to access consumer data in appropriate circumstances, even if the American public disagrees on what those appropriate circumstances are, vulnerabilities will persist. And so long as the state vigorously asserts an interest in the fetus at all stages of development through its police powers, even the most ambitious legislative reforms will not prevent reproductive surveillance.

privacy rights, as determined by [the General Data Protection Regulation.]").; IT for Change, *supra* note 215 at 8; Privacy International, *supra* note 172.

[336] *See supra* note 96 (finding that that none of the apps included in the study "were able to provide the necessary information on all privacy rights, as determined by [the General Data Protection Regulation.]"); Privacy International, *supra* note 173 (reporting on the results of Data Subject Access Requests and finding that one app did not provide the requested data, one did not respond, and one refused to let the consumer publish the data).

[337] Neil Richards & Woodrow Hartzog, *A Duty of Loyalty for Privacy Law,* 99 WASH. U. L. REV. 961 (2021).

[338] Danielle Keats Citron, *A New Compact for Sexual Privacy,* 62 WILLIAM & MARY L. REV. 6 (2021).

[339] Michele Estrin Gilman, *Feminism, Privacy, and Law in Cyberspace,* Oxford Handbook of Feminism and Law in the U.S. (Deborah L. Brake, Martha Chamallas, & Verna L. Williams, eds.) at 15 (2021); Michele Estrin Gilman, *Periods for Profit and the Rise of Menstrual Surveillance,* 41 COLUM. J. GENDER & L. 100, 113 (2021).

[340] MY BODY, MY DATA ACT, 117th Congress 2d Session.

[341] Statement of James B. Comey, Director Federal Bureau of Investigation, before the Senate Judiciary Committee, *Going Dark: Encryption, Technology, and the Balance Between Public Safety and Privacy,* (July 8, 2015) https://www.fbi.gov/news/testimony/going-dark-encryption-technology-and-the-balances-between-public-safety-and-privacy.

B. The Hail Mary of Influencing Change

Laws and regulations could theoretically improve protections for consumers of period and fertility trackers. But, realistically speaking, they probably will not. The priorities of state and federal agencies are subject to logistical realities and political influence. Mandated interventions are also frequently subject to legal challenges. These challenges create delay and are likely a doomed proposition in light of the current makeup of the Supreme Court and its recent decisions. The instability—and, more importantly, the improbability—of these solutions means they are insufficient to address the fragility of remaining reproductive rights, especially in states that criminalize reproductive choices. Unfortunately, then, we cannot pin our hopes exclusively on the law. But our choices are not perfectly binary. The technology industry, interest groups, and even individual consumers are better positioned to avoid the worst possible outcomes in the short term. And as scary a proposition as that is, it is preferable to waiting for the government to impose mandated solutions that will take far longer to implement but may never come and possibly fall short even if they do.

1. Technology Industry Solutions

Viewed idealistically, the technology industry is responsible for addressing abuse facilitated by their platforms.[342] The First Amendment protects individuals from government prohibitions on protected speech, but private industry is not the government. Companies—including ones with a substantial percentage of market share like Apple, Google, Twitter, and Meta—can and do prohibit various types of speech all the time (though that may soon change).[343] For now, these platforms' terms of service may specify that they will remove abusive, offensive, or factually misleading information. As a result, these companies will suspend or ban accounts or products from their respective platforms when they run afoul of specified terms of use.

Thus, Big Tech actors can be powerful at moderating which apps have access to their stores and platforms. A power that could prove important in limiting the availability of bad, ineffective, or insecure period and fertility tracking apps in ways the government cannot or will not. And this ability is not purely theoretical, even as applied to religiously contentious or politically charged products. For example, in 2019, Google responded to significant public outcry by removing an app

[342] *See* Gilman, *Cyberspace, supra* note 339, at 15.
[343] *See e.g.* NetChoice LLC v. Ken Paxton. *See also* NetChocie LLC v. AG of Florida.

promoting conversion therapy, a discredited and harmful practice claiming to change the sexual orientation, gender identity, or gender expression of LGBTQ people,[344] developed by a Texas-based Christian group.[345] However, whether Google could get away with this type of viewpoint censorship now or in the future is an open question.

Assuming ongoing content moderation legal challenges fizzle out or resolve in favor of technology companies, app stores could take this power a step further and use their influence to require more detailed efficacy information to list a product in the app store.[346] For example, app stores could take a more proactive approach in requiring disclosure, akin to existing privacy labels, and display of certain use and efficacy information and use that information in search result algorithms that put better apps at the top, where consumers are more likely to download them.[347] A period and fertility tracking app developer could always refrain from providing information about efficacy—for example, by indicating that none is available[348]—but the app store would present it in search results below trackers that provide evidence of efficacy and specify how the app generates predictions.[349]

There is reason to believe private actors can and would engage in this type of voluntary behavior. Companies like Apple and Google have an interest in ensuring quality apps on their platforms. Beyond being a component of corporate social responsibility and cultivating consumer goodwill, they also have to protect the economic interests of themselves and their shareholders. Apple and Google control over 95% of the app store market,[350] and both offer their own period and fertility tracking product.[351] Identifying competitors engaging in harmful practices that could sour the product category's reputation can help good products succeed. And bad publicity may be enough to engage in this type of self-regulation.[352]

Further, in addition to requiring evidence labels or policing the products available on their platforms, the technology industry can fill the gaps created by the lack of federal action through independent,

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[344] GLAAD, What is Conversion Therapy, https://www.glaad.org/conversiontherapy.

[345] Ryan Browne, *Google Removes Anti-Gay App That Promoted Conversion Therapy After Backlash,* CNBC (March 29, 2019) available at https://www.cnbc.com/2019/03/29/google-removes-anti-gay-app-that-promoted-conversion-therapy.html.

[346] Leah R. Fowler, *Health App Lemons,* 74 ALA. L. REV. -- (forthcoming).

[347] *Id.*

[348] *Id.*

[349] *Id.*

[350] David Currey, *App Store Data (2022),* BUSINESS OF APPS (January 11, 2022) https://www.businessofapps.com/data/app-stores/.

[351] *See supra* notes 110-11.

[352] Rory Van Loo, *The New Gatekeepers: Private Firms as Public Enforcers,* 106 VIRGINIA L. REV. 467, 476 (2020).

private-sector regulatory programs. Groups like Executives for Health Innovation and the Center for Democracy & Technology proposed one such program.[353] Their work introduces a value-proposition framework for four key constituencies: consumers, companies collecting health-related data not covered by HIPAA, the FTC, and HIPAA-covered entities.[354] Importantly for this Article, the framework would focus on *how,* not *what*, consumer health information is used, shifting the burden of privacy risk from consumers to companies and helping consumers select technologies with less confusion and risk.[355] It would also create an avenue for consumer complaints and corrective action.[356] They would apply their framework through a self-regulation program—akin to the American Bar Association or the American Medical Association—that would establish rules and procedures and promulgate codes of conduct to which members would agree and adhere.[357] Participating companies would enjoy the financial and reputational benefits of setting themselves apart from competitors.[358]

Participation would be voluntary, and an independent third-party organization would ensure compliance.[359] As the framework's developers note, this third-party accountability and consumer input are critical to avoid the inherent conflicts of interest in companies regulating themselves.[360] As they observe, industry action like this has the added benefit of being faster, nimbler, and more adaptable than legislative efforts that have failed to materialize.[361] However, like the mandated solutions discussed above, they do not address the problem of law enforcement.

2. App Developer Approaches

Importantly, a technology company need not be as powerful as Apple, Google, or Meta to influence change, either collectively through private-sector regulatory programs or through independent actions. Any app developer can make more accurate and secure products independent of external coercion, perhaps using improvements as a

[353] *See generally* Executives for Health Innovation, *The Case for Accountability: Protecting Health Data Outside the Healthcare System*.

[354] Proposed Consumer Privacy Framework for Health Data (February 2021).

[355] The Case for Accountability, *supra* note 353, at 9-10.

[356] *Id*. at 10.

[357] *Id*. at 13.

[358] *Id*. at 10.

[359] *Id*. at 13.

[360] *Id*. at 14.

[361] *Id*. at 13.

marketing tool. This may ultimately be the most promising and realistic avenue for fast efficacy and privacy reform.

All period and fertility tracking apps should be safe and accurate and clearly delineate the scope of appropriate uses. App developers should consider diverse and inclusive perspectives in product design.[362] Specifically, they should include medical professionals among the array of stakeholders providing input as a way to ensure efficacy and medical soundness.[363] These efforts, in turn, can help developers provide better, more inclusive period and fertility trackers with fewer biases, inaccuracies, and stereotypes baked into the product.[364]

Investing in the upfront work to develop an efficacious and inclusive period and fertility tracker is admittedly an expensive proposition. But other funding avenues exist outside of traditional approaches to data monetization, and they need not happen at the exclusion of low-resource or vulnerable populations. For example, federally funded research grants or foundation awards may become available. Reproductive rights organizations or private donors may seek opportunities to fund accurate and private apps.[365] Apps that choose to charge a fee can do so on a sliding scale that accounts for a consumer's ability to pay.[366] Insurance companies can likewise step up and improve access to evidence-based apps.[367]

More opportunities exist to innovate with privacy and data security. App designers can include disclaimers about possible data uses—like the potential for individual or state actors to use app data to identify early pregnancies or suspicious menstrual patterns. Developers can promote anonymity by not requiring registration or an email address.[368] Those same apps could encrypt data or ensure that all data is only stored on a user's phone, meaning the lack of email addresses would not raise additional problems with the HBNR in the

[362] Mikki Kressbach, *Period Hacks: Menstruating in the Big Data Paradigm,* TELEVISION & NEW MEDIA DOI/10.1177/1527476419886389 (2019); Adrienne Pichon, Kasey B. Jackman, Inga T. Winkler, Chris Bobel, and Noemie Elhadad, *The Messiness of the Menstruator: Assessing Personals and Functionalities of Menstrual Tracking Apps,* J. AM. MED. INFORMATICS. ASSOC. 29(2): 385-399 (2022). *See also* Gilman,, *Cyberspace, supra* note 339 at 28.

[363] *See* Gilman, *Cyberspace, supra* note 339, at 28.

[364] *Id.*

[365] *See supra* note 338, at 1830.

[366] *See* Gilman, *Periods for Profit, supra* note 339 at 113.

[367] Lauren Tonti, *Femtech Fatale: Access to Femtech in Public Health Insurance Systems,* 3 EUROPEAN JOURNAL OF PUBLIC HEALTH 5 (2020). In recent years, Medicare, employers, and other payers have demonstrated a willingness to expand coverage of digital health services. Solomon Center Report, *supra* note 234, at 8.

[368] *See supra* note 173.

event of a breach.[369] Relatedly, app developers can also limit risks by collecting less data.[370] Less data makes it less likely that hackers and other interested parties use data for nefarious purposes.[371] As lawmakers have underscored for Google's location data practices, the decision to collect and retain data is exactly that—a choice.[372] Companies can and should make different choices with respect to collecting and sharing data.[373]

Period and fertility tracking app developers must also anticipate law enforcement's role in policing pregnant bodies. For example, they might develop a product that does not collect user data or does so in a way that is unusable.[374] A company will not need to worry about complying with a warrant if they do not have relevant data in the first place. Further, app developers can build in a "warrant flag," which would notify the user if the app were under government surveillance.[375]

The list goes on. App developers can take new approaches to informed consent and third-party data sharing, abandoning traditional terms of service and privacy policies. As others have offered, blockchain and nonfungible tokens (NFTs) provide novel avenues for improved data security and for consumers to specify in advance the entities with whom they are (and are not) comfortable sharing their health data.[376] In this way, developers do not drop out of the data economy altogether and can even contribute to beneficial subsequent uses, like research, but in a way that respects consumer preferences.

Apps like the ones this Part contemplates are not unthinkable. Two German examples of publicly funded, non-extractive alternative

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[369] The HBNR only applies to unsecure data. The HBNR does not require apps that encrypt personal health records no notify people. U.S. FEDERAL TRADE COMMISSION, *supra* note 252.

[370] *See supra* note 338, at 1821.

[371] *Id.*

[372] Letter from 40 members of Congress to Google CEO Sundar Pichai, May 24, 2022.

[373] *See, e.g.*, In the Matter of the Search of an Apple iPhone Seized During the Execution of a Search Warrant on a Black Lexus IS300, California License Plate 35KGD203 (U.S. Dist. Ct. Cent. California) (2016) (in which Apple refused to comply with an order compelling Apple Inc. to assist federal agents in unlocking an iPhone related to a 2015 terrorist attack in San Bernadino).

[374] *See supra* note 4.

[375] *Id.* ("A "warrant flag" is an automated message warning users when the system is being monitored by the government. Such a system is indispensable when operators receive a warrant that includes a gag order, preventing them from notifying users. However, when operators already have a warrant flag system installed, an automated warning will go out whenever they fail to take action and reset a periodic timer. While the government can order operators to remain silent, they legally can't force operators to reset warrant flags, making it a lawful way to communicate.")

[376] Kristin Kostick-Quenet, Kenneth D. Mandl, Timo Minssen, I. Glenn Cohen, Urs Gasser, Isaac Kohane, and Amy L. McGuire, *How NFTs Could Transform Health Information Exchange,* 375 SCIENCE 6580 (February 4, 2022); Sebastian Porsdam Mann, Julian Savulescu, Philippe Ravaud, and Mehdi Benchoufi, *Blockchain, consent and prosent for medical research,* 47 J. MED. ETHICS 244 (2021).

femtech apps already exist.[377] There is *Periodical*,[378] an ad-free and open-source menstruation tracker that was initiated as a community project with no external funding,[379] and *drip*, developed with funding from Germany's Ministry of Education.[380] Both apps promote privacy by only storing data on the user's device.[381] *Euki*—developed by Women Help Women,[382] an international activist non-profit—does not collect or store any data and has no back-end system.[383] It also anticipates nefarious uses by, for example, allowing users to enter "0000" when opening the app under duress to display a false screen.[384] These initiatives provide examples of what is possible for app developers and collaborators willing to think outside the box.

While undertaking these efforts to improve efficacy, protect consumer data, and foster informed consumer decision-making is valuable in itself, there are also commercial benefits. Research has spotlighted *Clue* among competing apps regarding the clarity and transparency of their privacy policy. Particularly noteworthy behaviors include specifying third parties with which *Clue* shares user data, as well as an ability for the consumer to opt-out of deidentified data sharing with vetted researchers.[385] That *Clue* is so popular is a testament to their attention to consumer needs and interests. Or, at the very least, their attention to the GDPR given that *Clue* is a Berlin-based company.[386] This supports the proposition that innovative apps can stand out among competitors for their behaviors, voluntary or otherwise, and reap the financial benefits of that popularity. In a post-*Dobbs* future, highly effective apps that promote and protect a user's ability to understand and control their own body and data will have an advantage over those that do not. However, marketing claims about accuracy and privacy will always merit suspicion and scrutiny.

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[377] *See supra* note 215.

[378] Periodical https://play.google.com/store/apps/details?id=de.arnowelzel.android.periodical.

[379] *See supra* note 215.

[380] *Id.*

[381] *Id.*

[382] WOMEN HELP WOMEN, womenhelp.org.

[383] EUKI APP, https://eukiapp.com/.

[384] EUKI APP, https://eukiapp.com/privacy-faq ("If someone asks you to open Euki and you don't want them to see your data, enter "0000" when you open the app and we'll display a false screen. You can also customize what content areas are viewable on your dashboard to hide some and make others easily available.").

[385] *See supra* note 173.

[386] Clue (@clue), TWITTER (May 4, 2022, 9:29 AM) https://twitter.com/clue/status/1521859643055685636 (reassuring consumers that health data is private and safe, keeping sensitive data safe is fundamental to company values and business models, and noting obligations under the GDPR to apply special protections to users' reproductive data).

3. Group and Individual Action

Reproductive rights organizations and groups viewing technology as a new frontier of abortion rights activism will find significant opportunities for meaningful reform. For example, by adopting period and fertility trackers as a priority issue, these groups can raise consumer awareness about the risks and limitations of existing apps, particularly in combination with academic researchers.[387] These groups can also identify constituent needs and raise money to fund the design and development of alternative products that are not purely extractive, or highlight and promote apps that are effective and protect privacy to the maximum extent possible.[388]

Some groups are already active, particularly in the data privacy space. Grassroots organizations like Our Data Bodies illustrate how interviewing, community organizing, and capacity building can contribute to developing more inclusive data privacy laws.[389] As feminist scholars have identified the ever-shrinking divide between the physical bodies of app users and the bodies of data that users produce,[390] a corresponding shift of digital consent akin to sexual consent—one that envisions consent as proactive, specific, continuous, and ongoing, and allows for negotiation by all involved parties[391]—is needed.[392]

Dedicated action by motivated groups with well-defined policy proposals can be successful. Indeed, the Cyber Civil Rights Initiative (CCRI), a group dedicated to combating online abuses that threaten civil rights and civil liberties, has assisted with drafting model criminal laws and working with members of Congress to develop new approaches

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[387] An existing example in Mental Health is the One Mind PsyberGuide https://onemindpsyberguide.org/.

[388] *See supra* note 215 at 15.

[389] *See* Gilman, *Cyberspace, supra* note 339.

[390] Anja Kovacs & Tripti Jain, *Informed consent- Said who? A Feminist Perspective on Principles of Consent in the Age of Embodied Data, https://internetdemocracy.in/reports/informed-consent-said-who-a-feminist-perspective-on-principles-of-consent-in-the-age-of-embodied-data* (2020).

[391] *Id.* at 16-19.

[392] There's even a Feminist Data Manifest-No, a declaration of 32 refusals of harmful data regimes and commitments to new data futures that centers the needs of vulnerable and minoritized populations. *See* Feminist Data Manifest-No https://www.manifestno.com/. Specifically, the Manifest-No envisions a world in which no means no in all online interactions, including the meaningful ability to decline digital surveillance without opting out of technologies entirely. Refusal #9 Feminist Data Manifest-No https://www.manifestno.com/. It also frames consent in line with the Planned Parenthood FRIES definition (freely given, reversible, informed, enthusiastic, and specific) instead of notice-and-choice. Refusal #15 Feminist Data Manifest-No https://www.manifestno.com/; Planned Parenthood, Sexual Consent, https://www.plannedparenthood.org/learn/relationships/sexual-consent.

in the context of nonconsensual pornography,[393] and have even defended related state laws from First Amendment challenges in court.[394] They also reach across the public-private divide to the technology industry to develop policies.[395] Other players are active in reshaping the consumer technology space as well. For example, Accountable Tech, a non-profit advocating for structural reform of social media companies, filed a petition with the FTC in 2021 requesting rulemaking to prohibit surveillance advertising as an unfair method of competition.[396] The right organization could replicate these efforts to address the problems of period and fertility trackers and post-*Dobbs* surveillance. A centerpiece of any advocacy should be pushing back against the criminalization of abortion, reproductive decision-making, and fetal-harming behaviors during pregnancy. Avoiding criminalization will be integral to retaining the protections of current and future privacy laws, no matter how imperfect they may be.

Finally, individuals have an important part to play. A significant body of literature suggests that consumers are unlikely to shop for terms in digital contracts, influencing the market's trajectory as a so-called "informed minority,"[397] especially in contracts of adhesion where the option to negotiate more favorable terms is unavailable.[398] But, health apps and advertising may be different.[399] The example of *Clue* above may indicate that at least some consumers shop for privacy promises. While *Clue* is by no means perfect,[400] its popularity suggests that at least the market for privacy terms is less homogenous than one might assume, creating the potential for influencing the market.[401]

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[393] Cyber Civil Rights Initiative https://cybercivilrights.org/.

[394] *Id.*

[395] *Id.*

[396] Accountable Tech Rulemaking Petition.

[397] Yannis Bakos, Florencia Marotta-Wurgler & David R. Trossen, Does Anyone Read the Fine Print? Consumer Attention to Standard-Form Contracts, 43 J. LEG. STUD. 1, 1 (2014) (testing the informed-minority hypothesis by studying "the Internet browsing behavior of 48,154 monthly visitors to the Web sites of 90 online software companies to study the extent to which potential buyers access the end-user license agreement" and finding that "only one or two of every 1,000 retail software shoppers access the license agreement and that most of those who do access it read no more than a small portion").

[398] *See, e.g.*, Uri Benoliel & Shmuel I. Becher, *The Duty to Read the Unreadable*, 60 B.C. L. REV. 2255 (2019); Ian Ayres & Alan Schwartz, *The No-Reading Problem in Consumer Contract Law*, 66 STAN. L. REV. 545 (2014); Florencia Marotta-Wurgler, *Will Increased Disclosure Help? Evaluating the Recommendations of the ALI's "Principles of the Law of Software Contracts"*, 78 U. CHI. L. REV. 165, 179–81 (2011); Omri Ben-Shahar & Carl E. Schneider, *The Failure of Mandated Disclosure*, 159 U. PA. L. REV. 647, 649 (2011); Robert A. Hillman & Jeffrey J. Rachlinski, *Standard-Form Contracting in the Electronic Age*, 77 N.Y.U. L. REV. 429 (2002). *See also* Todd D. Rakoff, *Contracts of Adhesion: An Essay in Reconstruction*, 96 HARV. L. REV. 1174 (1983).

[399] *See* Fowler, Hawkins and Roberts, *supra* note 185, at 15-19.

[400] *See supra* note 215 (noting a lack of transparency about Clue's collaborators).

[401] NANCY S. KIM, WRAP CONTRACTS: FOUNDATIONS AND RAMIFICATIONS (2013).

Even if an informed minority does not or cannot exist, other more realistic consumer governance mechanisms may be in play. There is room for what others have called a "crusading minority"—those diligent activist consumers who see seller injustice and bad behavior and complain, file reports, post bad reviews, and sue.[402] Activist consumers are not constrained by traditional understandings of cost-benefit analysis, reading or understanding the fine print in consumer contracts, or any baseline requirement for a critical mass of like-minded consumers.[403] Instead, they act on more idiosyncratic motivations and respond to transactional expectations instead of stipulated terms.[404] By being sufficiently loud and creating a public relations crisis, sometimes a crusading minority of just one person is enough.[405] For example, in May 2022, one journalist wrote an exposé about data marketplace Narrative selling information about consumers of period and fertility trackers and convinced the company to take those datasets down, even though it had done nothing illegal.[406] And in a world of ubiquitous social media, this approach may prove particularly effective at influencing change and raising consumer awareness.

Economic theories about consumer "minorities"—be them informed or crusading ones—bring us to yet another avenue to influence changes that can help avert femtech's dystopian future. Consumers can also protect themselves—to an extent. Users should be critical about what apps they select, using research to inform app choice.[407] Those who use apps for contraceptive purposes should push back on automation bias, which is the tendency to trust technology over and above individual judgment. Instead, users should understand what data the app's algorithm uses to generate predictions. They should also understand what variables can invalidate readings, such as the influence of alcohol and sleep on basal body temperature.[408] A firm understanding of the menstrual cycle and the physiological signs of ovulation will help users understand the strengths and limitations of fertility awareness as a form of contraception.

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[402] *See generally* Yonathan A. Arbel & Roy Shapira, *Consumer Activism: From the Informed Minority to the Crusading Minority,* 69 DEPAUL L. REV. 2, 233 (2020).

[403] *Id.* at 255.

[404] *Id.* at 256.

[405] *Id.* at 258.

[406] Joseph Cox, *Data Marketplace Selling Info About Who Uses Period Tracking Apps,* VICE (May 17, 2022) https://www.vice.com/en/article/v7d9zd/data-marketplace-selling-clue-period-tracking-data.

[407] Catherine Roberts, *These Period Tracker Apps Say They Put Privacy First. Here's What We Found,* CONSUMER REPORTS (May 25, 2022) https://www.consumerreports.org/health-privacy/period-tracker-apps-privacy-a2278134145/.

[408] *See supra* note 163.

Finally, users should configure their devices to help augment privacy where feasible, such as using two-factor authentication, ad blockers, and turning off geolocation tracking.[409] Several privacy advocates have published privacy guides for various pro-choice stakeholders,[410] and so has the Department of Health and Human Services.[411] Others, though, have rightly cautioned that even the most robust and impractical individual privacy-enhancing precautions are powerless in a world as connected as ours.[412] At least as far as period and fertility tracking apps are concerned, limiting the data a consumer shares is an unworkable solution for a product that depends on vast quantities of data to improve predictive abilities. To that end, users should research apps that only store data locally on the user's device and do not participate in third-party data sharing.[413] They should also be intensely skeptical of developer claims that all user data is anonymized,[414] that the app employs end-to-end encryption,[415] or that the company will delete user data.[416] Importantly, consumers should never consent to warrantless law enforcement searches of a mobile

[409] *See* Gilman, *Periods for Profit, supra* note 339, at 111. *See also* Our Data Bodies, *Digital Defense Playbook: Community Tools for Reclaiming Data* (2018).

[410] See e.g., Daly Barnett, *Digital Security and Privacy Tips for Those Involved in Abortion Access,* ELECTRONIC FRONTIER FOUNDATION (May 4, 2022) https://www.eff.org/deeplinks/2022/05/digital-security-and-privacy-tips-those-involved-abortion-access; Shoshana Wodinsky, *11 Online Privacy Tips for Getting an Abortion,* GIZMODO (May 6, 2022) https://gizmodo.com/how-to-get-an-abortion-privately-after-roe-v-wade-11-ti-1848884984; Sarah Emerson and Emily Baker-White, *In A Post-Roe America, Googling "Abortion" Could Put You At Risk. Here's How To Protect Yourself,* BUZZFEED (May 4, 2022) https://www.buzzfeednews.com/article/sarahemerson/abortion-digital-privacy-guide; Lily Hay Newman, *How To Protect Your Digital Privacy if Roe v. Wade Falls,* WIRED (May 5, 2022) https://www.wired.com/story/roe-v-wade-privacy-practices/; Cahn and Manis, *supra* note 4 at 13-15.

[411] U.S. Department of Health and Human Services, Protecting the Privacy and Security of Your Health Information When Using Your Personal Cell Phone or Tablet, (June 29, 2022) https://www.hhs.gov/hipaa/for-professionals/privacy/guidance/cell-phone-hipaa/index.html.

[412] Janet Vertesi, *I Hid My Pregnancy From the Internet So I Know: Online Privacy Is Nearly Impossible,* LA TIMES (May 16, 2022, 3:10 AM) https://www.latimes.com/opinion/story/2022-05-16/pregnancy-internet-online-privacy-impossible; Janet Vertesi, *My Experiment Opting Out of Big Data Made Me Look Like a Criminal*, TIME, May 1, 2014, https://time.com/83200/privacy-internet-big-data-opt-out/.

[413] *See supra* note 406.

[414] *See supra* note 332.

[415] Leigh McGowran, *Period Tracker Stardust Rolls Back Encryption Claims Amid Scrutiny,* SILICON REPUBLIC (June 28, 2022) https://www.siliconrepublic.com/enterprise/stardust-period-app-encryption.

[416] Lawson v. Meta Platforms, Inc. (22-CIV-02723). Superior Court of the State of California County of San Mateo. (filed 7/5/2022) (alleging a "tool that allowed [Facebook/Meta Inc. employees] to circumvent Facebook's normal privacy protocols in order to access user-deleted data. This back-end protocol allowed Plaintiff's team to retrieve data in Messenger that users had chosen to delete. Facebook represented to its users that once data was deleted, it was not stored locally and could not be accessed." Further alleging that Facebook shared deleted data with law enforcement).

phone, even if the search is ostensibly unrelated to abortion and no matter how minor the alleged offense.[417]

While digital self-defense measures cannot hurt, we believe the onus should not be on the consumer to self-educate and complete due diligence or opt out of these technologies entirely. Instead, as this Part offers, the responsibility can and should be shared.

CONCLUSION

Those on the frontlines of pro-choice advocacy have long sounded the alarm on the dangers to *Roe* and the endgame of the anti-choice movement. For years, many of those same activists were called alarmists and assured that these reproductive rights stood on firm legal ground, protected by years of legal precedent. But, with *Dobbs*, those much-feared worries have come to pass, with far-reaching implications for other rights and the surveillance required to enforce proposed restrictions. But while the outcome is bad, it is also a call to action.

We and many others believe that the fight will not stop at bedrooms or doctor's offices and that the next battleground will be in the digital sphere.[418] Period and fertility trackers are, on their face, promising tools in the fight to preserve bodily autonomy as others would systematically strip it away. However, without significant reform to shore up accuracy, privacy, and consumer awareness, these technologies are also dangerous. Thus, our Article argues that a combination of top-down and bottom-up approaches is needed to ensure that our warnings of femtech's dystopian future do not come to pass like so many other warnings about reproductive freedoms.

Period and fertility tracking apps are the most obvious consumer technologies but by no means the only ones that could be instrumentalized to criminalize abortion[419] and other behaviors during pregnancy. Thus, femtech in the post-*Dobbs* legal landscape is but one stark example of a much bigger technological threat. But the answer should never be to tell those who are or are capable of becoming pregnant to stay off the Internet. We all deserve better solutions than

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[417] *See* Mass Extraction, *supra* note 207.

[418] *See supra* note 209.

[419] Purchase patterns, location, and web search history, and text messages are a few examples. Geoffrey A. Fowler and Tatum Hunter, *Your Phone Could Reveal If You've Had An Abortion,* THE WASHINGTON POST (May 4, 2022) https://www.washingtonpost.com/technology/2022/05/04/abortion-digital-privacy/; Joseph Cox, *Location Data Firm Provides Heat Maps of Where Abortion Clinic Visitors Live* (May 5, 2022) VICE https://www.vice.com/en/article/g5qaq3/location-data-firm-heat-maps-planned-parenthood-abortion-clinics-placer-ai.

that. Technology in a world with an anemic right to privacy endangers everyone. But it will take dedicated action today—and a belief that we should remain steadfastly committed to avoiding the worst possible outcomes by whatever means available—to keep femtechnodystopia from becoming just a trial balloon for other, more far-reaching control.