

### Data privacy

# The femtech gold rush

Health tech firms believe that women are a lucrative and untapped market, but are their products worth the privacy costs, asks **Donna Lu**

WOMEN'S health is going digital. The past few years have seen an upsurge in female health technology products and services. But as the industry takes off, some are concerned that the promise of personalised care comes at the expense of women's privacy.

These products run the gamut of reproductive health, including contraception, fertility and pregnancy. Among the apps and devices are period trackers, breast pumps and pelvic trainers (see "Gadgets on sale", right).

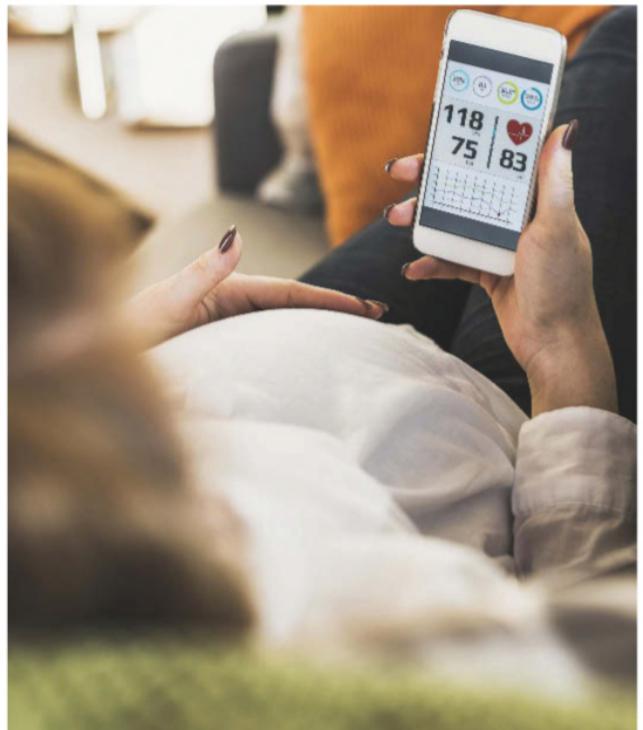
Ida Tin, CEO of menstruation-tracking app Clue, coined the term "femtech" to describe what she saw as a proliferation in products and start-ups "created around solving needs that women have because of our biology", she says.

In 2012, femtech companies attracted \$57 million in funding. That figure swelled to \$392 million in 2018 and major tech firms have got involved. Apple introduced period tracking to iPhones in 2015, and Fitbit added female health tracking to its watches in May last year, as did Garmin this April.

Tens of millions of women use period-tracking apps such as Clue, Glow, Ovia and Flo. Clue now has 11 million active monthly users, says Tin. These apps allow women to track intimate details, including menstruation, sexual activity,

**"For five years, I continued to receive marketing material as if I had a full-term, healthy pregnancy"**

cervical mucus, moods and pains. They can be used to monitor the fertile window for those trying to conceive, or to prevent pregnancy, as in the case of Natural Cycles, an app approved by the US Food and Drug Administration (FDA) as a form of contraceptive. The app has been criticised for resulting



body temperature, weight and resting heart rate, as well as seven out of nine emotional states, such as happiness and motivation.

The findings may seem obvious, particularly given that PMS is a well-established phenomenon. But Pierson points to the lack of rigorous, large-scale study of the cycle. "If it was obvious that this is an important natural feature of female variation, why are we still stigmatising it and not collecting data on it?" she says, adding that menstrual cycle data is often omitted from medical records.

"Apps are making it possible to do something completely different," says Amanda Shea, a research data analyst at Clue. "The scale is so massive that you can find patterns that you wouldn't be able to find in much smaller data sets." In Pierson's study, for example, the team noted a global drop in happiness the day after the 2016 US election won by Donald Trump. They also saw increases in happiness around Christmas.

But the scale at which intimate data is being collected also raises concerns about the lack of transparency in how it is stored and shared. Gaming company Activision Blizzard, for example, encourages its female workers to use Ovia's tracking services, and receives aggregated data about them. "Our maternity costs were high, and we needed a more effective solution," said Milt Ezzard of Activision Blizzard in a testimonial on the Ovia website.

Clue shares information with third parties like researchers, but doesn't make money selling user data, says Tin, and all research projects are detailed on its website. She suggests implementing a "good data practice" label for tech companies. It is clear that some firms go too

in unwanted pregnancies, but research shows it is more effective than condoms under typical use.

Martha, who lives in Abuja, Nigeria, started using a period tracker in 2015. Her cycles are irregular because she has polycystic ovary syndrome. "It was very useful for me in noting how long I went without my periods," she says. She also used the tracker to provide daily reminders while she was taking the contraceptive pill, and has logged pain, symptoms of premenstrual syndrome (PMS) and sexual activity. "I wanted to be sure that I wasn't risking getting pregnant."

These tools are clearly helping the women who use them, but who else benefits? "We're seeing a huge amount of growth in that area and a lot of capital flowing toward these

### Apps and devices can help to monitor pregnancy

period apps," says Quinn Grundy at the University of Toronto. The information they collect is valuable to the fertility and reproductive medicine industry, she says.

It also aids researchers. Emma Pierson at Stanford University in California and her colleagues recently used Clue data to study variations in mood, sexual behaviour and vital signs in more than 3 million women in 109 nations.

Analysing 241 million observations, they concluded that the menstrual cycle is the primary cause of cyclic variation in these three categories. It has the greatest effect on fluctuations in resting

## Gadgets on sale

**Ava:** a biosensing bracelet that aims to identify a woman's fertile window based on pulse rate and skin temperature measurements. The company that makes it announced last week that a peer-reviewed scientific study found that the bracelet was 90 per cent accurate.

**Bloomilife:** a flexible, wireless biosensor that, when affixed to a pregnant woman's abdomen, monitors uterine contractions during labour.

**Willow:** an unobtrusive, wearable breast pump that connects to an app.

**Coro:** a nipple shield that lets mothers track milk volume as they breastfeed.

**Bloomer Bra:** fitted with ECG sensors that track heartbeats and breathing rate.

**Elvie Trainer:** gamifies pelvic floor exercises and provides feedback through an app. The UK's National Health Service has linked up with Elvie, offering the device (pictured below) on prescription to people with a form of urinary incontinence.



ELVIE

far. In April, the UK Information Commissioner's Office announced it had fined Bounty UK, a pregnancy and parenthood site with an accompanying phone app, £400,000 for illegally sharing personal information about 14 million people. The ICO ruled that the company supplied data about new mothers, pregnant women and infants to third parties "without being fully clear with people that it might do so".

Many health apps legally share consumer data, says Grundy. She and her colleagues recently studied 24 top-rated apps used by medical professionals and the general public for medications and prescriptions. They found that 19 of these shared user data outside the app, including to third parties. These third parties also advertised the ability to share user data with 216 "fourth parties", including technology and digital advertising companies.

Most policies said the apps would collect user data and share it in an anonymised or aggregated format within the parent company or with trusted business partners, says Grundy. "That kind of language doesn't really give the user a very clear picture of who gets their data and what they're doing with it."

Even when shared data is aggregated and anonymised, it is relatively easy to identify people from it, says Mary Ebeling at Drexel University in Pennsylvania. A 2000 study found that just three details—gender, date of birth and a 5-digit ZIP code—were enough to uniquely identify 87 per cent of the US population.

In the US, only apps that treat or diagnose conditions are regulated by the FDA. This means that for apps like period trackers, there is no protection for associated data under the Health

Insurance Portability and Accountability Act, which applies to medical records. The system provides ample opportunity for marketers to access and use health data, says Ebeling.

Ebeling says that when she tried to conceive via IVF several years ago, her personal data was sold to marketing firms. She believes that her credit card records, which showed a number of large transactions at fertility clinics, would make it possible to infer she was undergoing IVF.

## Marketing gone wrong

On the day she found out she was pregnant, she returned home to a free sample of baby formula. But she miscarried months later, and got home after a confirmatory ultrasound to a free, year-long subscription to a baby magazine. She was targeted for years afterwards, and wrote a book about the experience.

"For five years, I continued to receive marketing material as if I had a full-term, healthy pregnancy. I gave birth to a live baby, that baby had no health complications and continued through infancy and toddlerhood," she says.

Apps make it even easier for firms to gather this kind of data, and new laws may be required to protect people. When the European Union's General Data Protection Regulation came into force last year, developers updated their privacy policies to give a much clearer picture of how they collect and use data, says Grundy.

Ebeling admits that data on women's health can aid research, but she fears that these apps will become a pervasive and lucrative tool for marketers. "There's little benefit if our data is in the hands of people who are trying to make money from us," she says. ■

## Working hypothesis

Sorting the week's supernovae from the absolute zeros



### ▲ Buzzwords

In a headline writer's dream, *Game of Thrones* actor Jerome Flynn has joined the advisory board of vegan cryptocurrency start-up VeganNation.

### ▲ White storks

Two wild white storks are taking a break from delivering human babies to become the first wild pair to breed in the UK for centuries, in Sussex.

### ▲ Ancient fungus

Fossils in the Canadian Arctic are the remains of a billion-year-old fungus. People wanting to beat the record should check the inside of their fridge.

### ▼ Genetic tests

DNA-testing firm 23andMe and Airbnb are selling holidays allowing people to "connect with their ancestry", which is just literal nonsense.

### ▼ Amazon workers

The internet giant has "gamified" drudgery in its warehouses. Workers can now speed up a virtual car on a racetrack by picking items faster.

