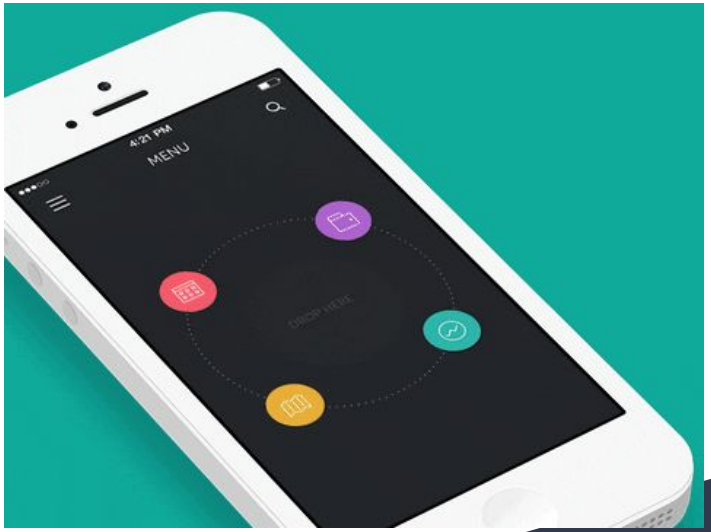
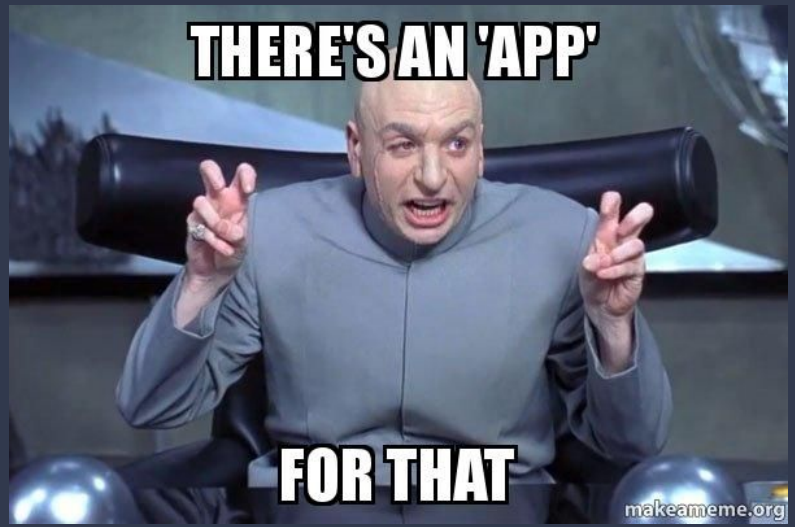


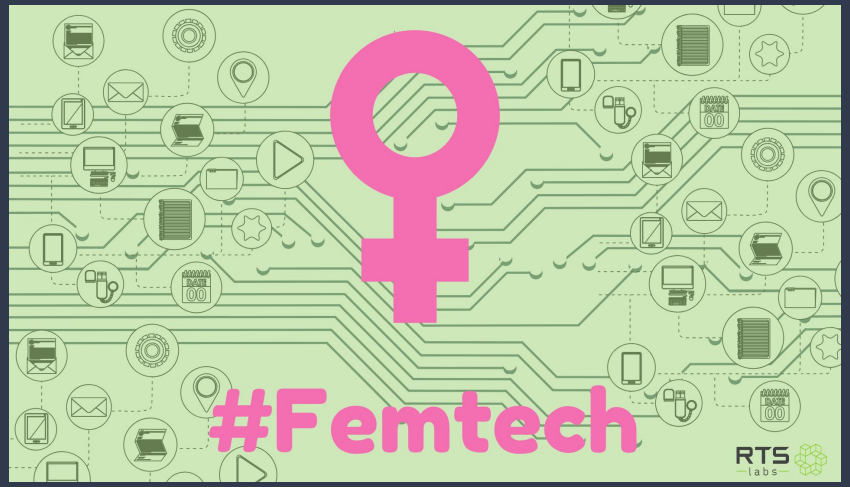
Mobile Health Apps: Yea or Nay?



Ten years after the first health apps launched in Apple's App Store, there are **now more than 325,000 health apps** available!

The mobile health app market is dominated by a few large mostly North American companies making apps focused on running, exercise, diabetes, women's health, and weight loss. The app is often a tool to market devices, sensors, and services such as consulting or coaching.

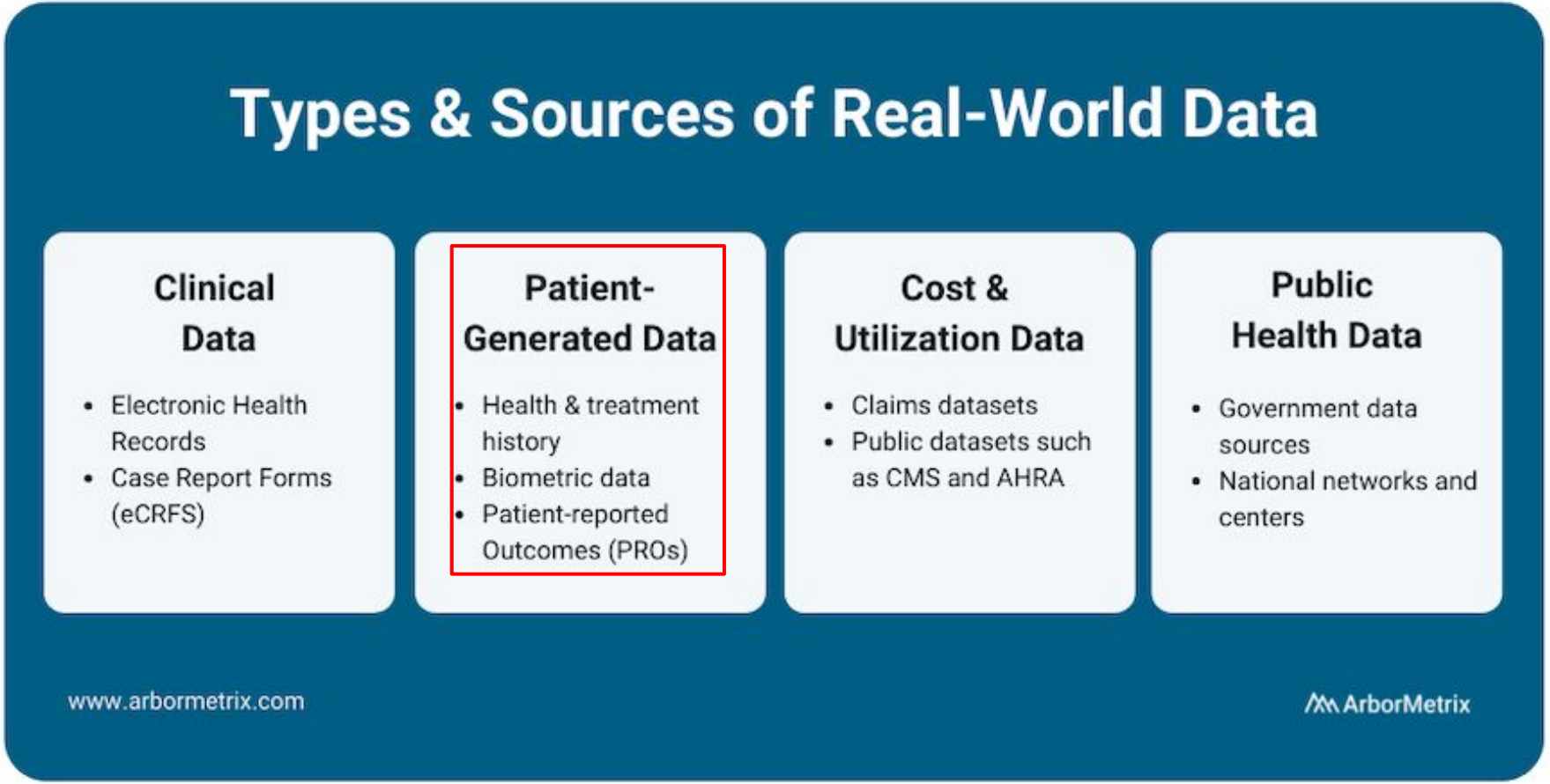
https://www.annualreviews.org/doi/full/10.1146/annurev-publhealth-052020-103738



In this presentation, we will look at some considerations for “mhealth” apps in general, with a particular focus on “femtech”

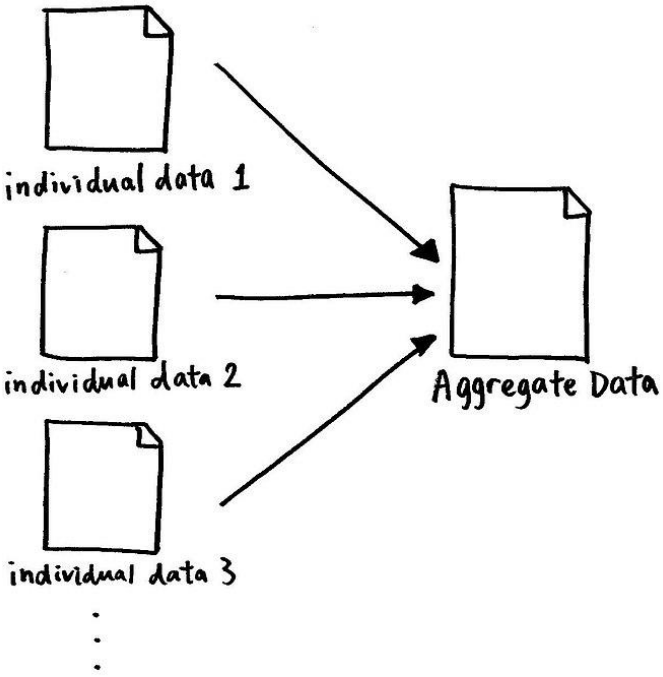
- Collect “real world data” for research
- Empower users
- Teaches women's reproductive health to those who don’t get taught

The role of real-world data in health care is growing.



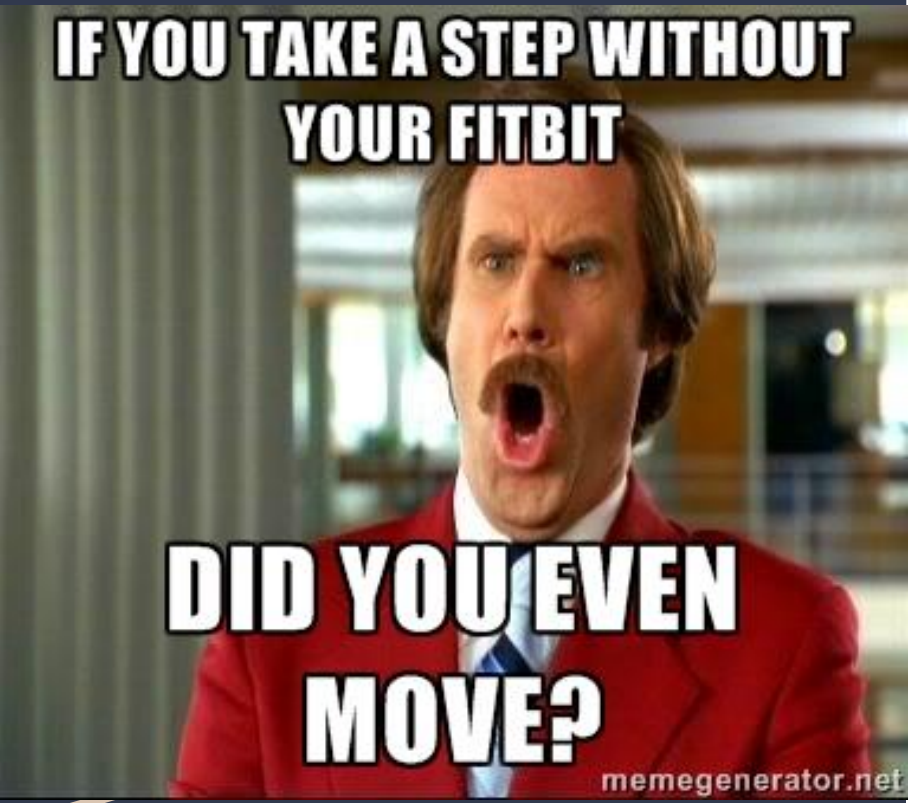
We may aggregate, anonymize or de-identify your Personal Data so that it cannot reasonably be used to identify you. Such data is no longer Personal Data. We may share such data with our partners or research institutions or use for statistical purposes, for example, we may share or use general age, demographic information and aggregate statistics about certain activities or symptoms from data collected to help identify patterns across users in articles, blog posts and scientific publications. Sharing this data contributes to the advancement of scientific research on women's health. Our legal basis for processing your data for this purpose is legitimate interest.

Many health apps use data that has user identity removed from it for the purposes of collecting Real World Data for scientific research.

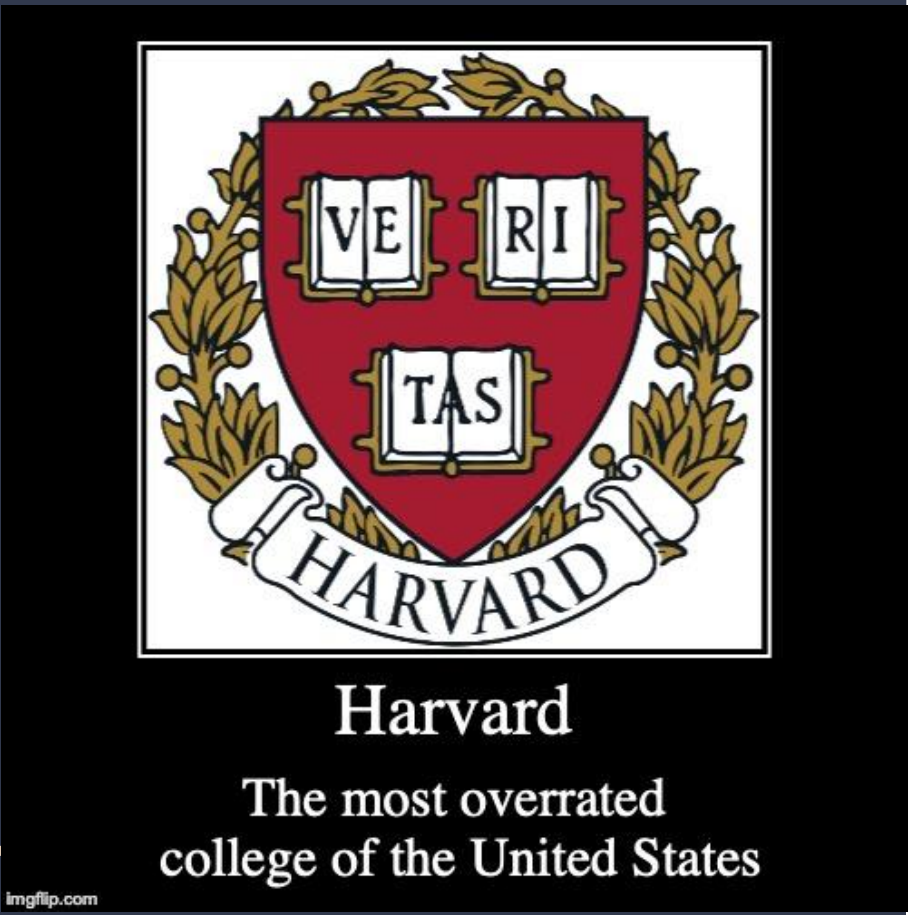


Aggregate data is a term that refers to the information a business collects from multiple sources and compiles into summary reports. The collected information can be numerical or non-numerical, often leading to valuable insights.

Empowerment YAY!!!!!!!

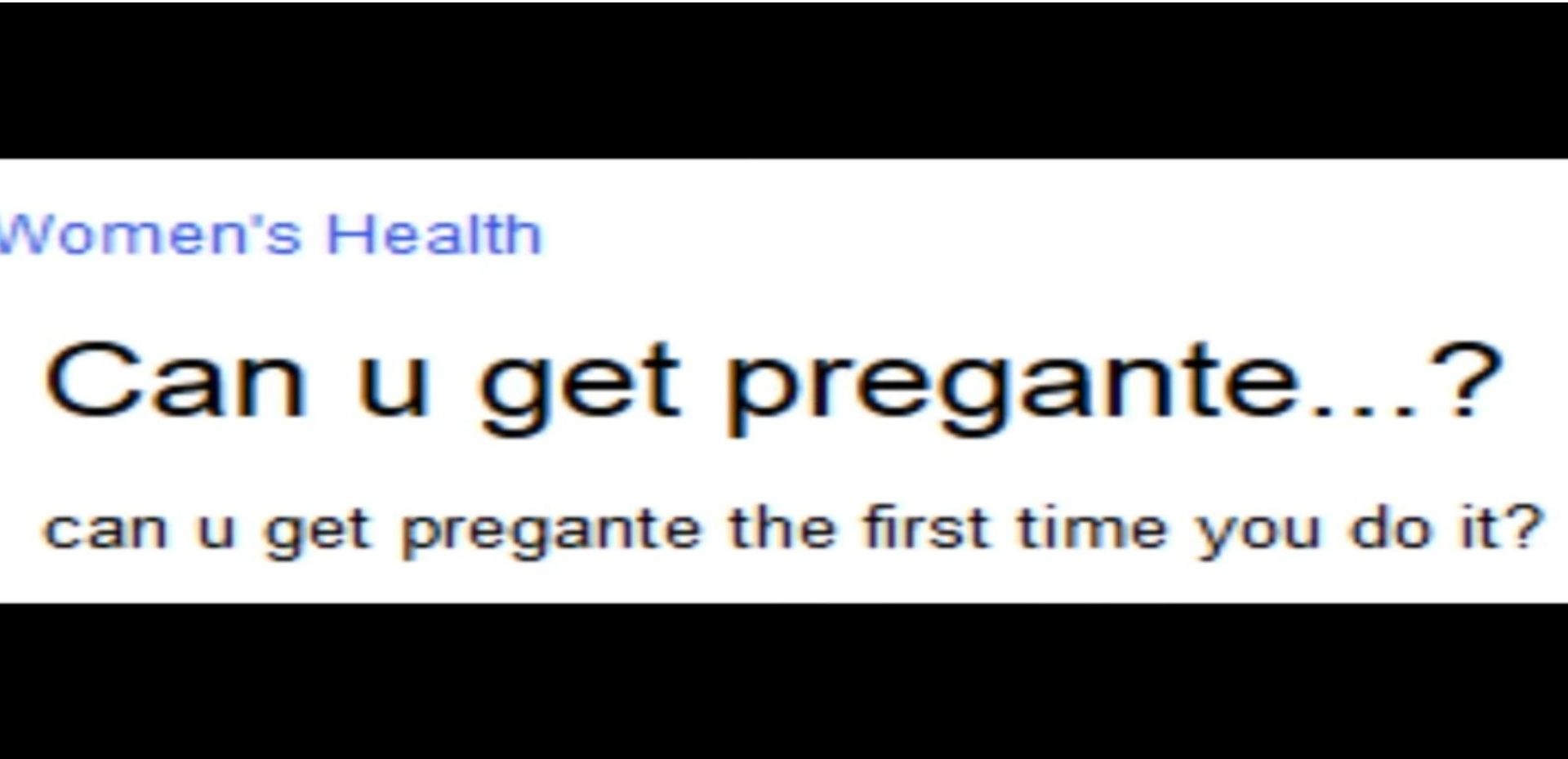


Patients that track their health and fitness with mobile apps, especially in conjunction with wearables (e.g. fitbits, glucose monitors, heart monitors) are able to communicate to their doctors better about their current health concerns.



Studies show that users of mHealth devices and apps can become more autonomous and more motivated in self-regulating their health behavior and more engaged and consistent in their lifestyle and wellness behavior, which leads to improved health outcomes. - Harvard Business Review

Edumuhcation



- With the rise in widespread use of mobile phones in developing countries, Femtech allows women's reproductive help research to be disseminated more equitably across the globe.
- Lily Health App - Nairobi based app
- Apps and other solutions can be delivered in English.
- Chatbots can be an engaging tool to spread awareness and fight misinformation.
- The insights the companies can provide to NGOs, researchers and policy makers can be invaluable.

Care Mother Fetal Monitoring (Bangladesh Based)

- The core of the work being done with Femtech in developing countries is focused on education and awareness.
- Empowering women by giving them knowledge and understanding of their own health and pregnancies is a step towards challenging some cultural and social norms as well as traditional gender roles.

- Lack of oversight
- Dubious efficacy
- Thinly veiled marketing ploy
- Major privacy concerns

Shouldn’t doctors be overseeing your health?

It’s the wild west out there! The vast majority of health and wellness apps are not subject to FDA regulation, let alone HIPAA rules--so little oversight!

Apple and Google, not doctors, are the arbiters of quality.

On the other hand, the **FTC** has taken action against them for unsubstantiated claims that apps could treat or improve health conditions, for endorsements by individuals who failed to disclose conflicts of interest, for misrepresentation of scientific evidence, and for lack of transparency around billing practices and technical problems...thanks FTC!

There is little clear, high-certainty evidence to suggest that the use of mobile health apps impacts health outcomes, particularly beyond the short term, either positively or negatively. Meta-analyses of randomized controlled trials (RCTs) of mobile health app interventions have found small to moderate, positive effects on some outcomes such as decreased sedentary behavior, anxiety or postpartum depression scores, and health-related quality of life but not on other outcomes such as physical activity promotion or smoking cessation.

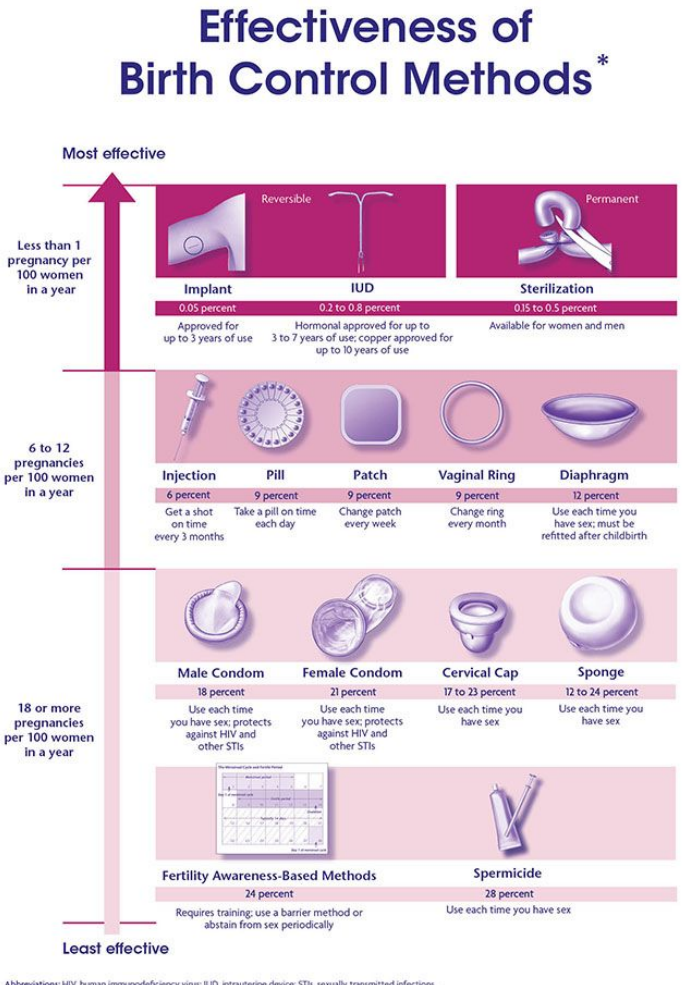
https://www.annualreviews.org/doi/full/10.1146/annurev-publhealth-031210-101218

Can they be harmful?

Just another source of misinformation, guilt and stress?

- Critical appraisals of app quality and functionality, however, suggest that numerous safety risks exist, including incorrect, incomplete, or variable information, gaps in features, lack of validation, delayed processing, failure to respond to a health danger, or faulty alarms
- Unnecessary health information and lifestyle advice may actually create worry and be a source of stress even if evidence based
- Apps can also trigger feelings of guilt and avoidance behavior, provoke resentment or other negative emotions, and undermine users' confidence when users struggle to meet health-related goals or targets

Despite disclaimers, for example, women may use ovulation trackers in lieu of other birth control methods, though the “rhythm method” has a high failure rate.



drip.

menstrual cycle & fertility

GET

And speaking of period apps...Cringy Names!

Do I really need this?

No I don't....but the corporations do! It's really just a way to track the "wealthy, worried and well"...and capitalize on it. And folks that DO need help aren't necessarily the target audience.

Rather than those who could really benefit, apps and wearables apps and wearables largely target the "wealthy, worried, and well" demographic For example, despite the striking disparities in pregnancy-related mortality and morbidity among racialized pregnant people in the United States, peripartum mobile health apps infrequently provided health information about conditions that disproportionately affect racialized people and lacked inclusivity in their imagery. Thus, mobile health apps may risk widening health disparities through lack of inclusivity and the provision of health information and digital interventions that disproportionately address the health needs of already advantaged groups

Just. A. Marketing. Ploy.

For example, fem-tech app Eve is owned by Glow, a company selling fertility products.

Basically, these apps are not intended to help women, but rather to gather data for targeted advertising of reproductive health, fertility and birth control products.

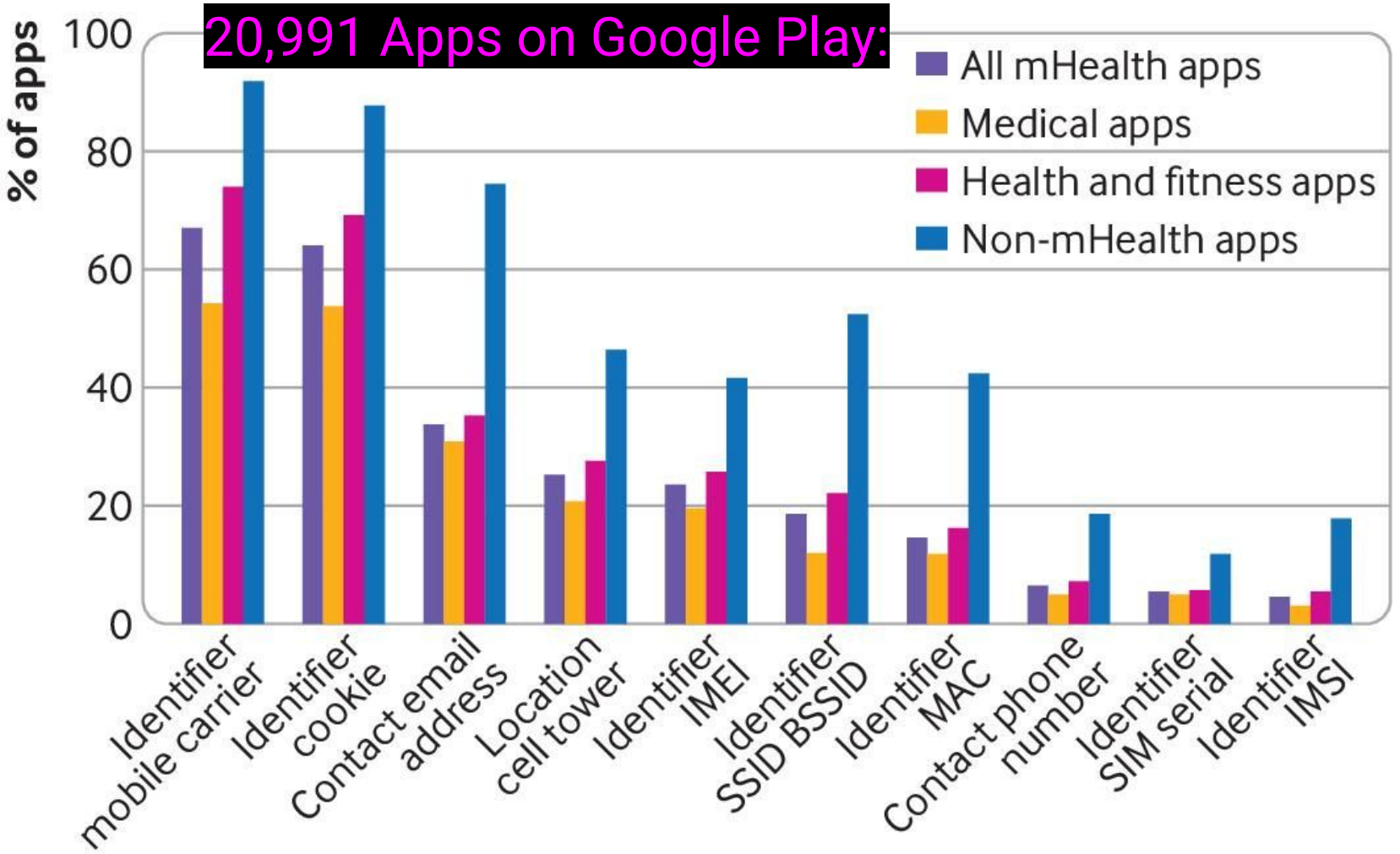
Thus, the value of user data collected through health apps is recognized not just for its potential to shape health outcomes. Mobile health apps have attracted billions of dollars in investment (84) and serve as gateways for user data to enter and flow through a larger mobile ecosystem made up of third-party analytics, social media, data aggregation, and digital advertising companies (43, 45). Mobile health apps are just one source of behavioral data that are shared, aggregated, and commercialized in ways that allow companies to document, predict, and influence people's social, political, and consumer behaviors, sometimes with exploitive or discriminatory results

But #1:

PRIVACY CONCERNS

Because these apps are not medical providers, your info is NOT protected by HIPAA or any meaningful privacy law...

In June 2021, the British medical journal found that of 20,991 Android health apps, 88% had tracking capabilities programmed in their code and 80% of all data collection operations were on behalf of third-party services


20,991 Apps on Google Play:
% of apps
100
80
60
40
20
0
All mHealth apps
Medical apps
Health and fitness apps
Non-mHealth apps
Identifier mobile carrier
Identifier cookie
Contact email address
Location cell tower
Identifier IMEI
Identifier SSID BSSID
Identifier MAC
Contact phone number
Identifier SIM serial
Identifier IMSI

Why should we care so much about our precious privacy?

They’re just trying to sell us stuff….or…?

Watch out ladies...

Goodbye... ROE V. WADE

Hello... DOBBS


Who wants your fertility data?

After Roe v Wade was overturned:

DELETE YOUR FEMTECH!

went viral on Twitter…

Can women seeking abortion care be prosecuted?

Though no state has as yet passed a law that explicitly allows for punishment of a woman who terminates their pregnancy, several states abortion ban language does not explicitly protect the woman from prosecution.

ARREST OF WOMAN IN TEXAS

In April 2022, a Texas woman was indicted and jailed for three days for a self induced abortion.

The charges were dropped, and she was reported by a nurse at the hospital, not an app,

BUT…

There are fears that zealous prosecutors may seek to use child protection laws to prosecute women who have procured abortions, or even people who have helped them obtain them, even for helping them cross state lines to obtain them.

Are your femtech apps protecting your privacy better than others? Not really.

- With the most popular apps, data is stored in the cloud rather than on your device, making it more susceptible to hacks
- Though you can delete your data, it may be stored up to 2 years (though in anonymized form)
- Your data may be shared with third parties (anonymized).
- Your IP address and location may be shared (for advertising purposes)
- Even when data is anonymized, clues can lead back to you
- Apps may share info with law enforcement **(Stardust's policy explicitly states that)**
  https://www.wired.com/story/period-tracking-apps-flo-clue-stardust-ranked-data-privacy/

FTC dings FLO…

But we already know they aren’t the only ones…

Privacy policies are not always clear or readable.

And apps may not be following their own privacy policies, such as Flo:

The FTC penalized the femtech app FLO because that ***despite promising to keep users’ health data private,*** Flo shared sensitive health data from millions of users of its Flo Period & Ovulation Tracker app with marketing and analytics firms, including Facebook and Google

And who are these third parties?

Texas law allows private citizens to sue abortion providers...

Could an association of such citizens be a THIRD PARTY buying data???

And even if the data shared is “anonymized” or “de-identified”...

Estimating the success of re-identifications in incomplete datasets using generative models

Luc Rocher, Julien M. Hendrickx & Yves-Alexandre de Montjoye

Nature Communications **10**, Article number: 3069 (2019) | Cite this article

Abstract

While rich medical, behavioral, and socio-demographic data are key to modern data-driven research, their collection and use raise legitimate privacy concerns. Anonymizing datasets through de-identification and sampling before sharing them has been the main tool used to address those concerns. We here propose a generative copula-based method that can accurately estimate the likelihood of a specific person to be correctly re-identified, even in a heavily incomplete dataset. On 210 populations, our method obtains AUC scores for predicting individual uniqueness ranging from 0.84 to 0.97, with low false-discovery rate. Using our model, we find that 99.98% of Americans would be correctly re-identified in any dataset using 15 demographic attributes. Our results suggest that even heavily sampled anonymized datasets are unlikely to satisfy the modern standards for anonymization set forth by GDPR and seriously challenge the technical and legal adequacy of the de-identification release-and-forget model.

Conclusion

Is it worthwhile to input sensitive health info into apps with at best minor health benefits?

Because of resounding privacy concerns, the answer is clearly

NO!