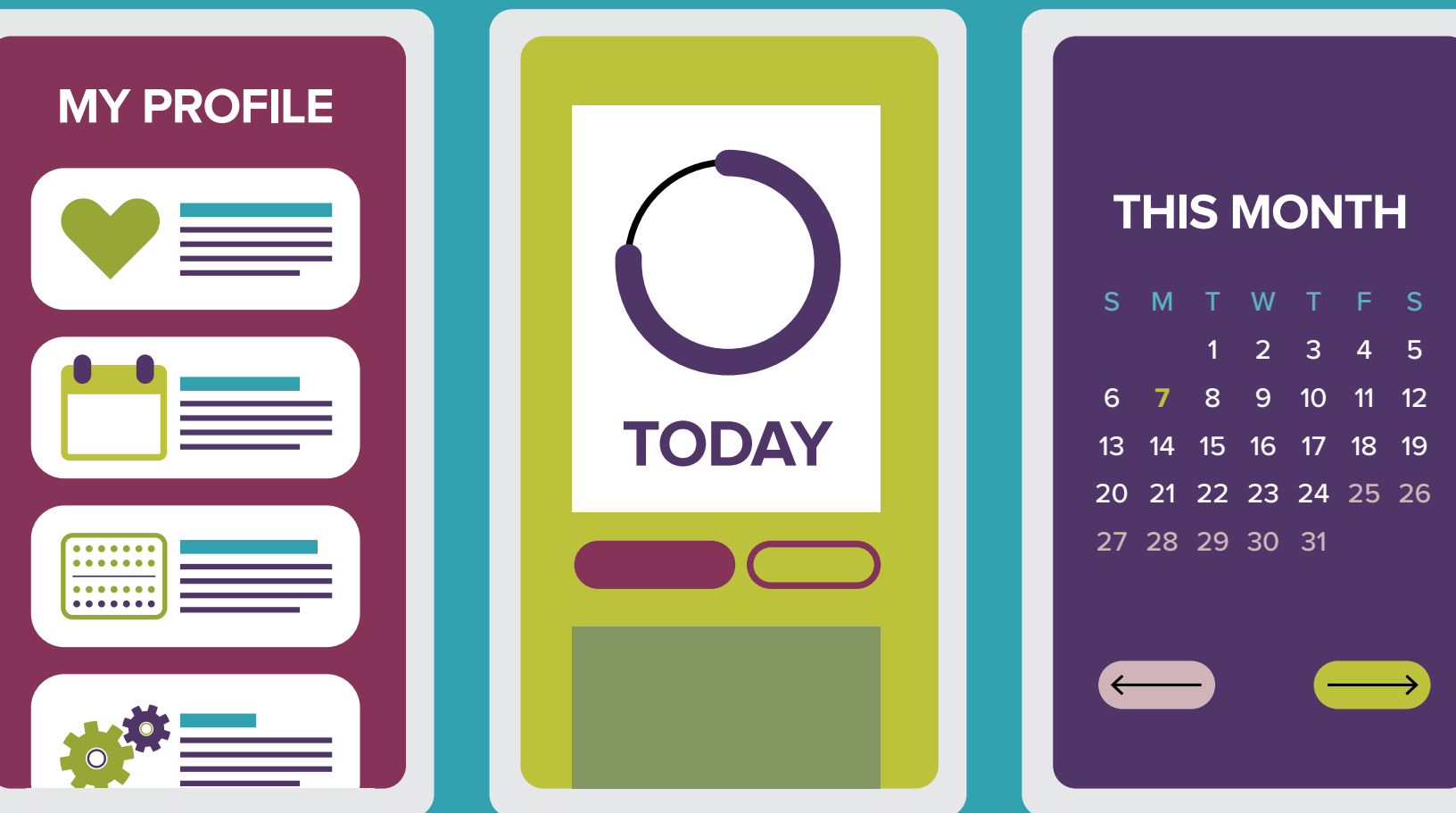


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Modeling the Market Size for a Contraceptive Fertility Tracking App in the Philippines



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Background

Women have relied upon their menstrual cycles for generations to track their fertility and plan their families. In the last ten years, period tracking apps have entered the market, allowing women to track their cycles and menstrual health using their smartphones. Contraceptive Fertility Tracking Apps (CFTAs) represent a recent innovation to this category – more than just a period tracking app, CFTAs are backed by a growing body of effectiveness data and cleared by the US Food & Drug Administration (FDA) to be used as a method of contraception. The market for apps that have been approved for use as contraception is small, but likely to grow.^{1,2} As an emerging market category, it is important to distinguish the unique benefits of these apps from other period tracking apps available, but the authors found inconsistencies in the terms used in existing literature. To be clear about which type of app we were referring to in this research, we've chosen to coin the term "Contraceptive Fertility Tracking Apps."³

Through direct consumer research, the USAID-funded Expanding Effective Contraceptive Options (EECO) project, led by Catalyst Global in close partnership with Population Services International (PSI), aimed to understand potential users of CFTAs and to estimate the market size for a hypothetical CFTA in the Philippines.

The market size estimate described in this technical brief was built on best practices identified in a recent landscaping review.⁴ The model and consumer research described in this technical brief were designed with a clearly articulated purpose and guided by consumer-focused research questions. The model also accounts for overstatement, looks at method uptake within the context of the whole method mix and has been transparently shared with collaborators and colleagues.



- 1 Jennings et al. (2019). Perfect- and Typical-Use Effectiveness of the Dot Fertility App over 13 cycles: Results from a Prospective Contraceptive Effectiveness Trial. *The European Journal of Contraception & Reproductive Health Care*, 24(2): 148-153.
- 2 Scherwitzl et al. (2017). Perfect-Use and Typical-Use Pearl Index of a Contraceptive Mobile App. *Contraception*, 96(6):420-425.
- 3 CFTAs are based on fertility awareness methods (FAM) and, as a result, could be referred to by other terms and acronyms in the wider literature, including FAM, fertility awareness-based methods (FABM) or modern fertility awareness methods (mFAM).
- 4 LaCroix et al. (2023). Demand Forecasting Approaches for New Contraceptive Technologies: A Landscape Review and Recommendations for Alignment. *Global Health: Science and Practice*, 11(1):e2200334.

Methods

While the study used a multi-phase mixed-methods design, the data relevant for the market size estimate was directly informed by two phases: a quantitative online survey (n=1600), and a smaller quantitative validation survey (n=200) conducted offline. The methods and results for the mixed-methods consumer research study are available in a publication pre-print.⁵

Study Population & Sampling Strategy

The population of interest for CFTAs is women of reproductive age (18-49) who have access to a smartphone with internet capabilities. Since this group is an internet-engaged population, the quantitative survey was conducted using an online survey approach.

We used an online panel from our local partner in the Philippines, Nielsen IQ, to recruit 1600 participants meeting the study inclusion criteria for the online quantitative survey. Sampling methods are detailed elsewhere.⁶

As the market size estimate is for the Philippines as a whole, the smaller quantitative validation survey was conducted to verify whether the online survey population responses were representative of a similar population recruited in an offline manner. For this reason, we recruited a small offline sample, to compare whether the online sample would be representative of the rest of the Philippines with regard to interest in and uptake of a CFTA.

Data

The online quantitative survey and offline validation survey collected the same data on respondent demographics, current family planning (FP) use, and willingness to use and pay for a CFTA. Participants were shown a 13-minute video to introduce a hypothetical CFTA, which combined several key features of actual, existing apps on the market. For example, the video detailed the app’s effectiveness, how it works and that it can be used offline, and compared and contrasted its features with other currently available contraceptive methods. This was done to ensure that respondents had a shared understanding of the other contraceptive methods available to them so that they could better reflect on their interest in using a CFTA in the context of the whole method mix.

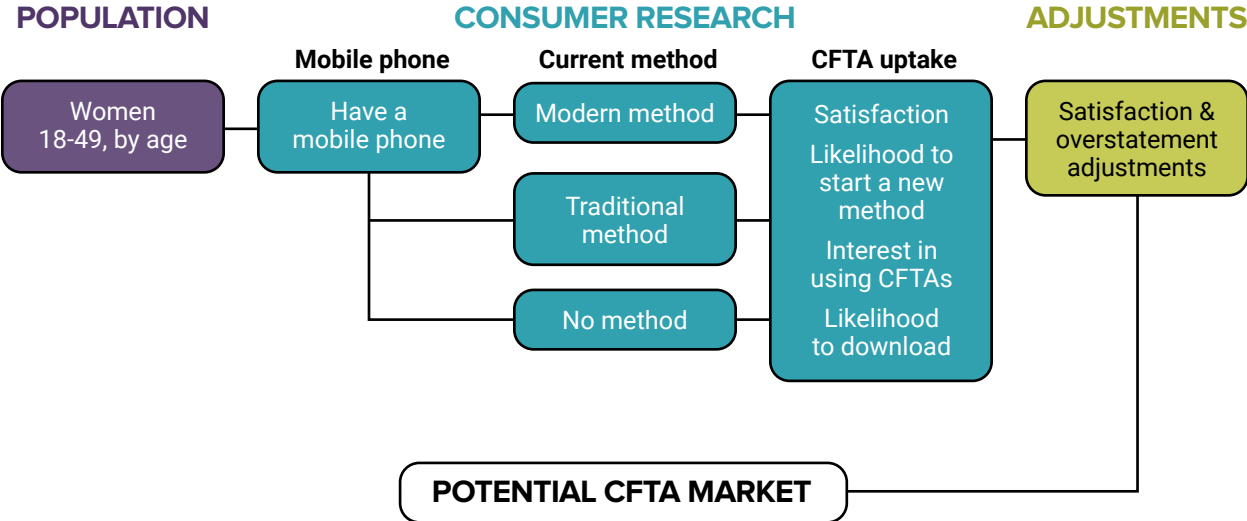
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⁵ Danna et al. (2023). There’s an App for That: Exploring the Market for Contraceptive Fertility Tracking Apps in the Philippines. [medRxiv 2023.07.31.23293317](https://doi.org/10.1101/2023.07.31.23293317) [Preprint].

⁶ Ibid.

Model

The CFTA market size model uses three main sources of information: the population of women of reproductive age in the Philippines, data collected from consumer research conducted in the Philippines, and adjustment factors made to survey responses, described in detail below (Figure 1).

FIGURE 1. Inclusion of Potential Users in Model of CFTA Market



Model Population

The population of women of reproductive age (18-49) in the Philippines was obtained from World Population Prospects using the Female population by single age, region, subregion, and country, annually, medium fertility variant estimate.⁷

Screening Questions

We only included data from women who met all of the screening criteria for the consumer research. For their data to be included in the model, respondents must: have ever used or might ever use an FP method in the future, and own and use a smartphone with internet/data capabilities at least once per month. As respondents were recruited from an online research panel, we also required that they had not taken part in other market research in the last four weeks.



⁷ United Nations, Department of Economic and Social Affairs, Population Division (2022). World Population Prospects 2022 (online edition). <https://population.un.org/wpp/>

Current Method Use

Research participants were asked to report their current method of contraception, as well as their satisfaction with their current method and the likelihood to uptake a new method. A subset of 43 respondents were dropped from the analysis for inconsistencies or inaccuracies in their responses (e.g., stating that they used an unrealistic number or combination of contraceptive methods).

CFTA Uptake

After being shown the video introducing the hypothetical CFTA, participants were asked, using 5-point Likert scales, about their interest in using a CFTA, as well as how likely they would be to download a CFTA if it were available to them right now.

Adjustments

Due to a tendency for overestimation, exaggeration, and to account for some desirability bias, we applied several discounting factors so as to not overestimate the potential CFTA market (Figure 2). For example, we removed all women from the market size estimate who were “very unlikely”, “somewhat unlikely” or “somewhat likely” to start a new method in the next 12 months, assuming that they would be unlikely to actually switch to a new method, regardless of their response.

Of the remaining women, we only included those who were “very” or “somewhat interested” in using a CFTA, removing those who were “maybe”, “probably”, or “definitely not interested” in using it. We further discounted these responses by assuming that 75% of those who were “very likely” and 50% of those who were “somewhat likely” would actually use a CFTA.

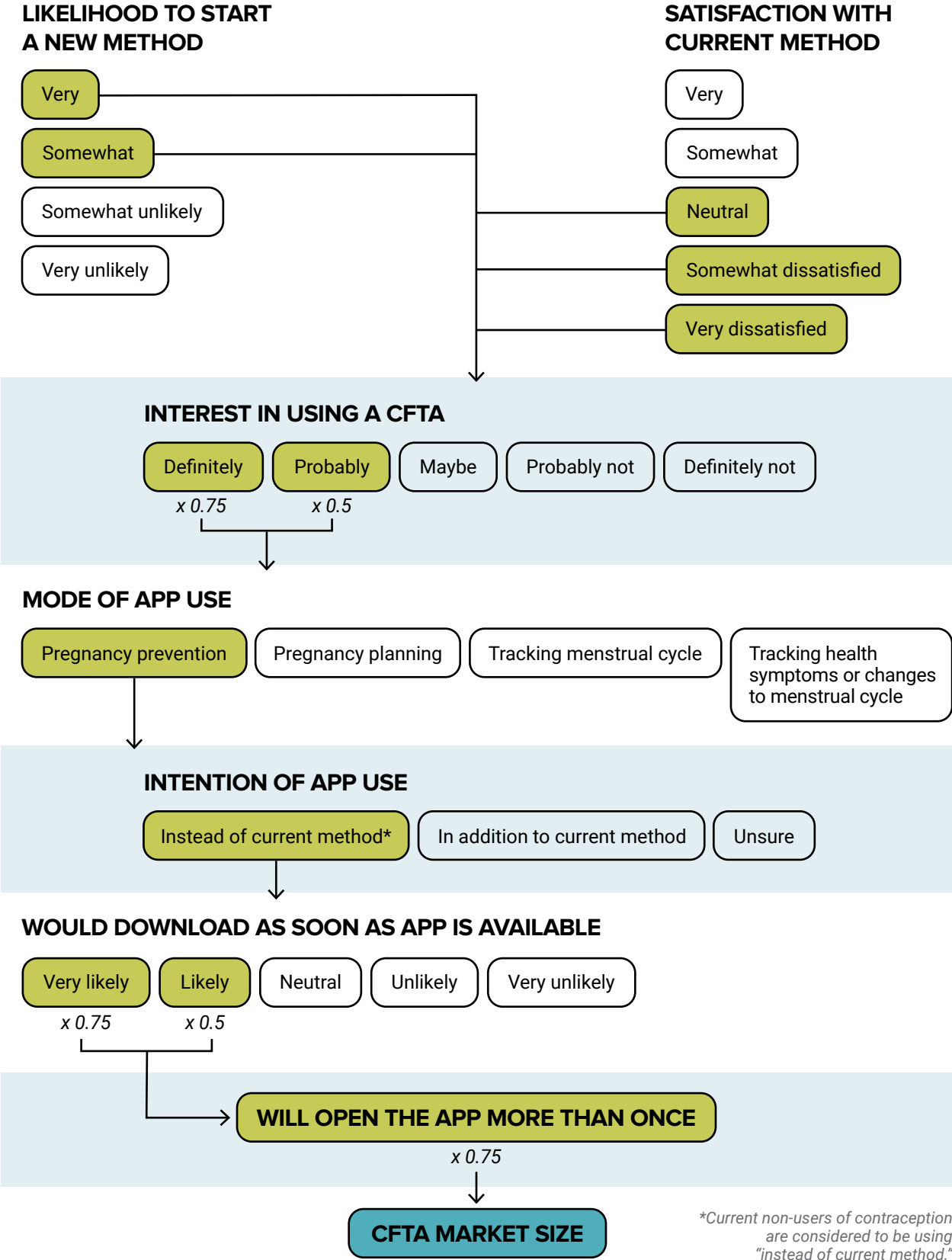
We also narrowed the population to those who stated they would use the app for pregnancy prevention (rather than helping to plan a pregnancy, or tracking menstrual cycles or health changes), and those who said they would use a CFTA instead of their current method (rather than using concurrently with their current method).

We asked women whether they would download the app now, if it were available to them. As with interest in using the app, we only included women who were “very likely” or “somewhat likely” to download the app now, and again applying the same 75% and 50% discount factors as before.

Consumer research⁸ indicates that 25% of users abandon mobile apps after one use. To estimate use for the CFTA, we applied this discount factor to give us the potential market size.

⁸ Localytics. (2019). Percentage of mobile apps that have been used only once from 2010 to 2019. <https://www.statista.com/statistics/271628/percentage-of-apps-used-once-in-the-us/>

FIGURE 2. Discount Factors Applied to Potential Market for CFTAs



Willingness to Pay

Consumers were asked whether they would be willing to pay for a CFTA, and if so, how much per month they were willing to pay. The detailed approach to assessing willingness to pay is described elsewhere⁹ but in short, respondents were given a random starting price (ranging from \$4-7 USD) and based on whether they were willing or unwilling to pay that price, the survey would automatically generate a new price for consideration in pre-determined increments. Respondents were also asked the maximum price that they would be willing to pay for a CFTA. These results were used to provide an estimated market size at different price points.

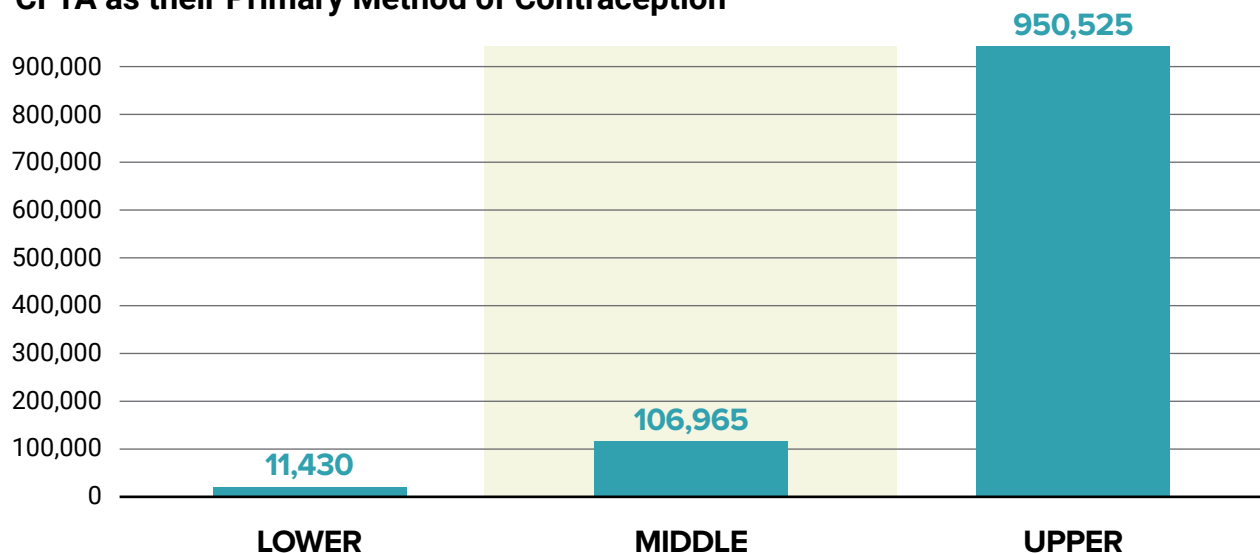
Uncertainty

We applied 95% confidence intervals for each variable to construct low and high estimates of the market size.

Results

Of over 26M women of reproductive age in the Philippines, we estimate that 106,965 women would download and use a CFTA as their primary method of contraception, ranging from a low estimate of 11,430 women to a high estimate of 950,525 women (Figure 3). Note that all subsequent analyses are based on the moderate estimate of the market size.

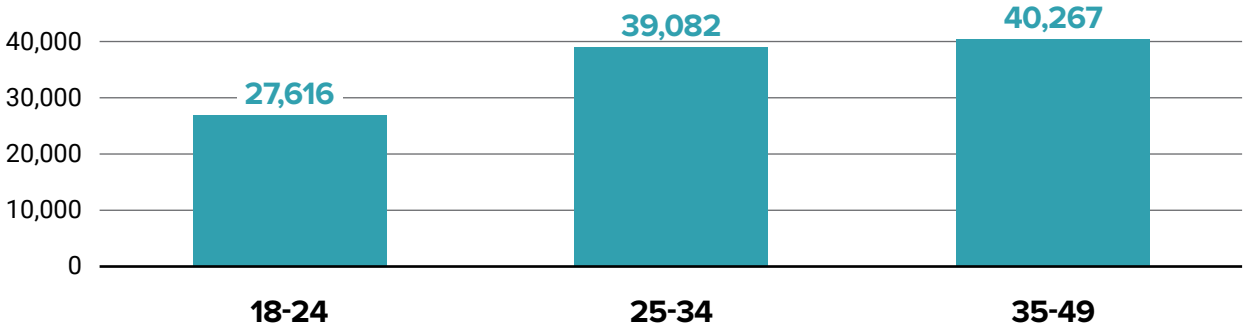
FIGURE 3. CFTA Market Size, Women Using a CFTA as their Primary Method of Contraception



⁹ Danna et al. (2023). There's an App for That: Exploring the Market for Contraceptive Fertility Tracking Apps in the Philippines. [medRxiv 2023.07.31.23293317](https://doi.org/10.1101/2023.07.31.23293317) [Preprint].

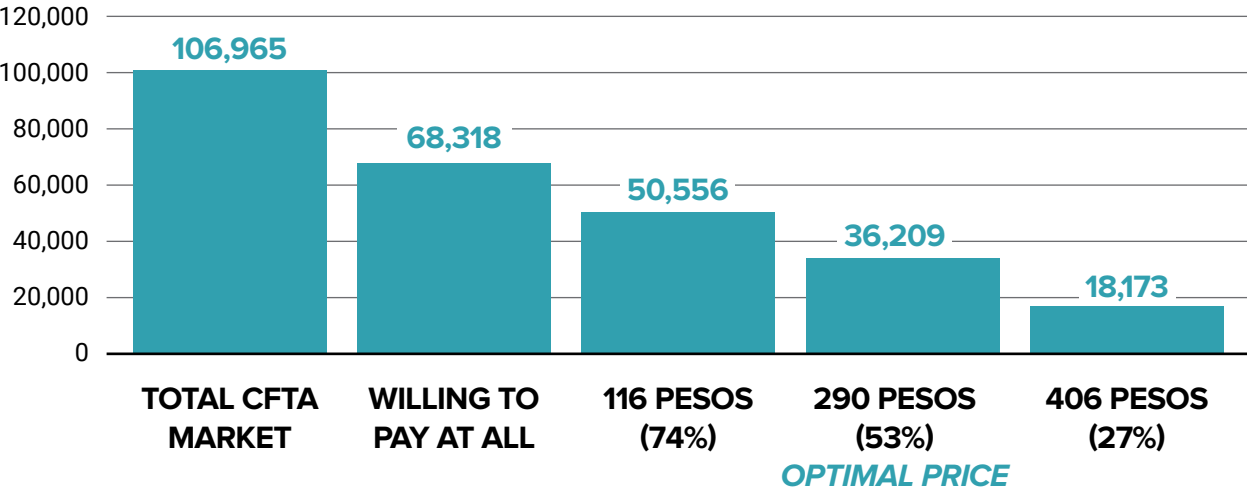
We found that of the potential users of CFTAs, there were fewer younger users aged 18-24 (27,616 women) than women aged 25-34 (39,082 users) or 35-49 (40,267 users) (Figure 4). Younger potential users were generally less likely to say they would switch to a new method and had higher satisfaction with their current methods. Younger users were also slightly less enthusiastic about their interest in using and downloading CFTAs. While overall rates of interest in the app were similar among age groups, younger women were more likely to say they were “likely to use/download” rather than “very likely to use/download.”

FIGURE 4. CFTA Market Size, Women using a CFTA by Age (moderate estimate)



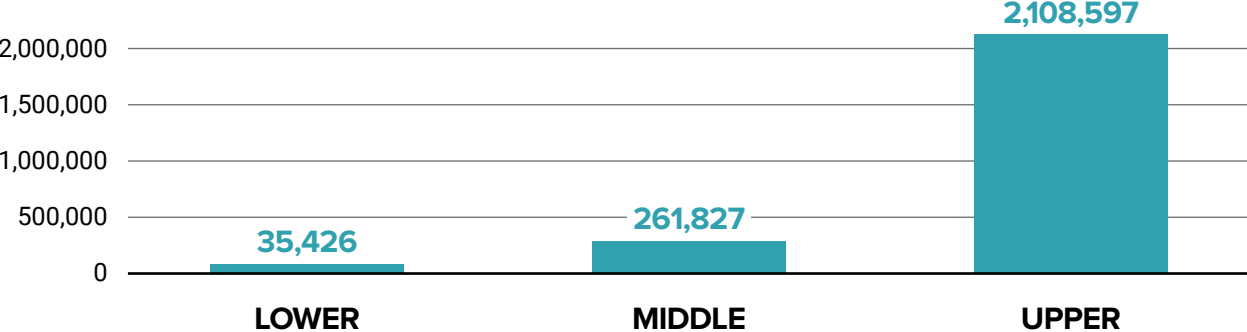
When we incorporate the willingness to pay data, we find that the market size drops substantially (Figure 5). Only 65% of women would be willing to pay for a CFTA, which results in an estimated market size of 68,318 women. Among those who were willing to pay, the optimal price point was found to be 290 pesos per month (about \$5.20 USD), at which point 53% of women (36,209 women) would still be willing to pay for the app. For the consumer, this is the maximum price that they would be willing to pay for a product or service. For the app developer, this is the price they could sell the app at to maximize profit, taking into account demand, revenue, and price.

FIGURE 5. CFTA Market Size, Women Using a CFTA at Varying Price Points (moderate estimate)



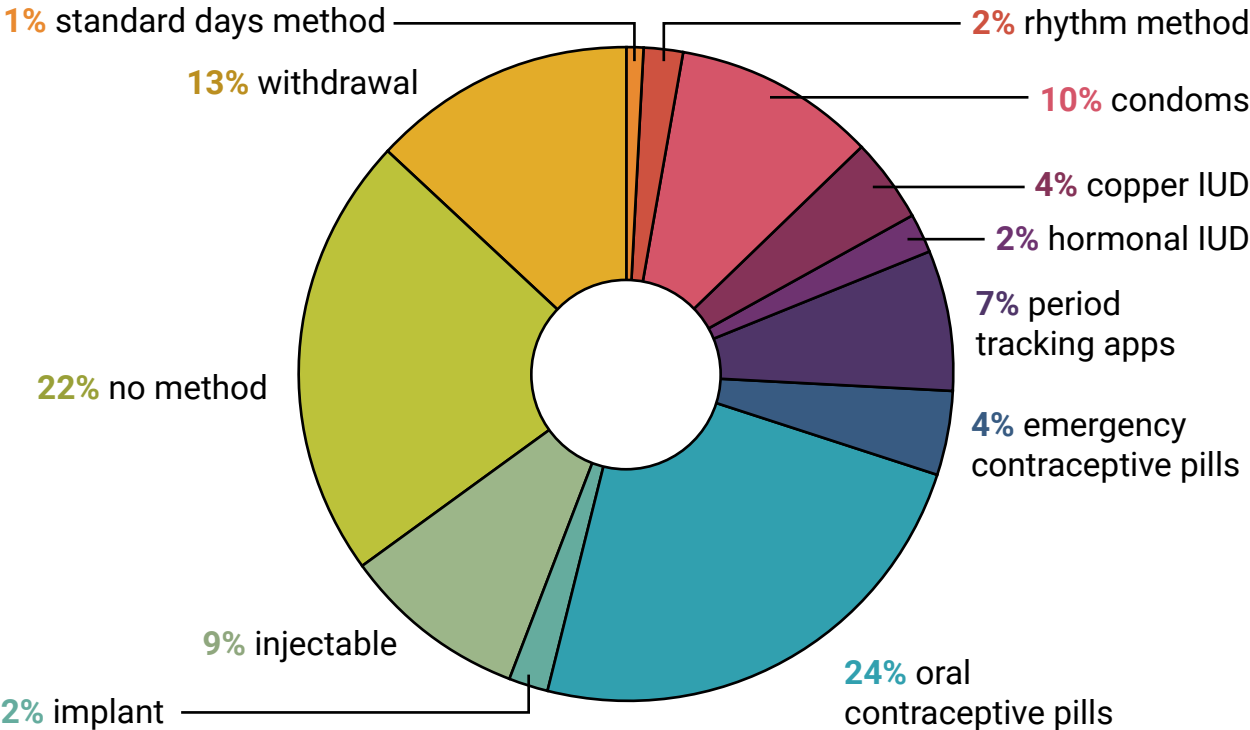
In Figure 3, we describe the CFTA market size for women using a CFTA as their primary method of contraception. However, CFTAs are unique in that they can easily be used alongside another method of contraception or used for pregnancy planning or health and menstrual cycle tracking. As a result, the potential market is larger than just those using a CFTA as their primary method of contraception. We estimate that approximately 261,827 women would use the app for any purpose or in addition to their current method, ranging from 35,426 women (low estimate) to 2,108,597 women (high estimate). Considering CFTAs as a multipurpose technology represents a doubling of the potential market of those using a CFTA as their primary method of contraception.

FIGURE 6. CFTA Market Size, Women Using a CFTA for Any Use (moderate estimate)



Twenty-four percent of potential CFTA users would switch from their current method of oral contraceptive pills (OCPs) to a CFTA (Figure 7), this high number likely being due to the prevalence of OCPs in the Philippines. However, approximately 22% of potential CFTA users are currently non-users of contraception, suggesting that CFTAs may address the needs of women not currently met by the method mix in the Philippines. We also expect that approximately 13% of potential users would be using a CFTA in place of exclusive use of the withdrawal method. Due to the nature of CFTAs, and their ability to be used alongside other methods, there is the potential and interest for CFTAs and other methods, including withdrawal, to be used simultaneously.

FIGURE 7. Among Adopters of CFTAs, Contraceptive Method from Which Women Would Switch



Validation Survey

The validation survey population differed from the online survey population in several key ways. The validation survey population was slightly older than the online population, as well as less likely to be using a method of contraception currently. Respondents in the validation survey were also less likely to express an interest in using a CFTA. This suggests that the interest of those recruited offline may be lower than our online-recruited population.

Discussion

There is a large range in the estimates of the CFTA market size, from a low estimate of 11,430 women to a high estimate of 950,525. This is partly due to large confidence intervals around the numerous variables in the model, all of which were disaggregated by age, and many of which were also broken down by current method of contraception. An additional factor affecting the uncertainty is the effect of scaling up estimates to a population of tens of millions of women, where even small changes are magnified.

The potential market size for CFTAs is similar in scale to the current market for other natural methods; the 2022 Philippines Demographic and Health Survey (DHS)¹⁰ showed that 1.7% of all women aged 15-49 reported using periodic abstinence as their current method of contraception, and 0% reported currently using the Standard Days Method. The number of estimated potential CFTA users falls into this range – our midrange estimate of 106,965 women demonstrates that approximately 0.38% of women aged 18-49 would take up a CFTA as their primary method of contraception.

We did not consider the effect that promotion, demand generation, or an introduction plan might have to drive uptake of a CFTA. This estimate represents those expressing interest in the app after one exposure, in a non-promotional way, in a setting where they are not seeking out information or a new contraceptive method. Promotion and demand generation directed to an online-engaged population could propel interest and uptake; additionally, education through more traditional FP channels (community health workers, providers) could also contribute to demand. Providing subsidized access to the app may help encourage uptake among those who are not willing to pay for the app.

Prior to the start of the consumer research study, there was a lack of evidence exploring the extent to which period tracking apps were already commonly used as contraception in the Philippines. We explored the use of these apps in our quantitative research, and sought to better understand how women might distinguish between a CFTA and other period tracking apps through in-depth interviews in our consumer research study. The results demonstrate that women are interested in using digital technologies for their contraceptive needs. However, it does make it more difficult to distinguish a new CFTA from currently available period tracking apps without clinical efficacy data to support their use as contraception. A promotion plan or demand generation activities for CFTAs would likely need to clearly articulate the benefits of a CFTA compared to existing period tracking apps.



¹⁰ Philippine Statistics Authority (PSA) and ICF. (2023). 2022 Philippine National Demographic and Health Survey (NDHS): Final Report. <https://psa.gov.ph/sites/default/files/2022%20NDHS%20Final%20Report.pdf>

CFTAs are unique among the current available contraceptive options in that they can be used for a variety of purposes throughout the reproductive lifecycle. For example, a woman could use a CFTA to track her menstrual cycle and learn more about her health, and then use the same app to track her fertility to try to become pregnant and/or use it as contraception to delay, space or limit pregnancy. CFTAs can also easily be used along with some other methods of contraception. It is possible that using the method alongside a traditional method like withdrawal, or a short-term method like condoms, would provide additional protection compared with either method alone, but more evidence would be needed to support this. The flexibility of using CFTAs alongside other methods and the continuity of use along the reproductive lifespan may make CFTAs an attractive option.

Conclusion

Evidence shows that the addition of effective contraceptive methods to an FP market can positively impact contraceptive use. While our modeling estimates that the total market for CFTAs in the Philippines may be small, it still represents a valuable addition to the method mix. CFTAs have a variety of features that potential users appreciate, including their ease of use, convenience, and lack of side effects (among others, discussed more fully in a forthcoming publication¹¹). CFTA can be used in addition to other methods, as well as for menstrual health and fertility tracking, providing additional health benefits to women throughout the course of their reproductive lives. Furthermore, the potential market for CFTAs could be grown with product promotion, demand generation, and a roll-out plan that subsidizes the app, driving additional interest and uptake. Stakeholders in the FP community of practice, including Ministries of Health, donors, and program implementers, should consider these unique attributes when weighing the potential impact of CFTA introduction relative to their level of investment.

¹¹ Danna et al. (2023). There's an App for That: Exploring the Market for Contraceptive Fertility Tracking Apps in the Philippines. [medRxiv 2023.07.31.23293317](https://doi.org/10.1101/2023.07.31.23293317) [Preprint].

Appendix

TABLE 1. Survey Questions and Responses Used in Model

Survey Question	Responses	Responses Included in Model
How old were you on your last birthday?	Age in years	Ages 18-24, 25-34, 35-49
There are various ways or methods that a couple can use to delay or avoid a pregnancy, have you ever used any method/s to delay or prevent pregnancy?	Yes No Unsure	Yes No Unsure
Do you think you might use any method/s to delay or prevent pregnancy in the future?	Yes No Unsure	Yes Unsure
Do you own and regularly (at least once per month) use a smartphone?	Yes No	Yes
Does your smartphone have the ability to access to the internet/data connectivity that would allow you to download an application?	Yes No	Yes
In the past 4 weeks, have you taken part in any market research study?	Yes No	No

<p>Of the methods that you said you have ever used before, which of these methods are you currently using to delay or avoid getting pregnant?</p>	<p>Implant Injectable Patch Ring CycleBeads Oral contraceptive pills Diaphragm Emergency Contraception, Female Sterilization Apps Hormonal IUD Copper IUD Lactational amenorrhea Male condoms Rhythm method Spermicide Standard Days Method Male sterilization Withdrawal None</p>	<p>Implant Injectable Patch Ring CycleBeads Oral contraceptive pills Diaphragm Emergency Contraception, Female Sterilization Apps Hormonal IUD Copper IUD Lactational amenorrhea Male condoms Rhythm method Spermicide Standard Days Method Male sterilization Withdrawal None</p>
<p>How likely or unlikely are you to begin using a new method of pregnancy prevention in the next 12 months?</p>	<p>Very unlikely to use a new method Somewhat unlikely to use a new method Somewhat likely to use a new method Very likely to use a new method Cannot decide yet Prefer not to answer</p>	<p>Somewhat likely to use a new method Very likely to use a new method</p>

<p>How satisfied are you with your current method of pregnancy prevention?</p>	<p>Very dissatisfied Somewhat dissatisfied Neutral/neither satisfied nor dissatisfied Somewhat satisfied Very satisfied</p>	<p>Very dissatisfied Somewhat dissatisfied Neutral/neither satisfied nor dissatisfied</p>
<p>If this app were available to you now, how interested would you be in using it now?</p>	<p>Definitely not want to use it Probably not want to use it Might or might not want to use it/cannot make a decision at this time Probably want to use it Definitely want to use it</p>	<p>Probably want to use it Definitely want to use it</p>
<p>You said you would probably or definitely want to use this app. At this time in your life, what would you use an app like this for? Select all that apply.</p>	<p>Helping to prevent a pregnancy Helping to plan a pregnancy Helping to track the days of your menstrual cycle Helping to track health symptoms or changes to your menstrual cycle</p>	<p>Helping to prevent a pregnancy</p>
<p>Previously you said that you were currently using a method of contraception. If this app were available to you now, how would you use it?</p>	<p>I would stop using my current method and switch to this app for pregnancy prevention I would use this app and my current method together I don't know/need more information to decide</p>	<p>I would stop using my current method and switch to this app for pregnancy prevention</p>

How likely or unlikely would you be to download this app as soon as it is made available?	Very unlikely (definitely would not download right away) Unlikely (probably would not download right away) Neutral/I don't know Likely (probably would download right away) Very Likely (definitely would download right away)	Likely (probably would download right away) Very Likely (definitely would download right away)
Do you think that you, or someone like you, would pay money to use an app like this?	Yes No I don't know/Maybe	Yes
Would you be willing to pay P{0} every month to use an app like this?	Yes No	Yes

TABLE 2. Adjustment Factors¹²

Variable	Response	Adjustment (multiplied by)
If this app were available to you now, how interested would you be in using it now?	Probably want to use it	0.75
	Definitely want to use it	0.5
How likely or unlikely would you be to download this app as soon as it is made available?	Likely (probably would download right away)	0.75
	Very Likely (definitely would download right away)	0.5

¹² LaCroix et al. (2023). Demand Forecasting Approaches for New Contraceptive Technologies: A Landscape Review and Recommendations for Alignment. *Global Health: Science and Practice*, 11(1):e2200334.

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