

The Family Planning Estimation Model: Forecasting the future by looking to the past

The most successful family planning programs make decisions based on accurate assessments of current need, as well as projections about future needs. Knowing the best estimates for the modern contraceptive prevalence rate (mCPR) and the percentage of women with an unmet need for contraception allows for better planning and more sustainable programming. Population surveys such as the Demographic Health Survey or other national surveys are typically the source of these estimates, but there are often lags of five years or longer between surveys, limiting the government's ability to assess the real-time impact of its programming, make any needed adjustments, and plan for the future. Countries that have data from multiple survey sources may find that the surveys present conflicting estimates, leading to uncertainty and making it difficult to develop a narrative around what contraceptive change is happening.

The Family Planning Estimation Tool (FPET)

This innovative model was designed to use all available data to develop annual estimates of mCPR, unmet need, and demand for family planning satisfied by modern methods beyond the date of the last survey and into the future. Having these more recent estimates without waiting for a new survey gives countries the information they need to better monitor progress, estimate how mCPR and unmet need are changing in response to current programming, and make necessary adjustments to accelerate progress toward their FP goals.

FPET is a Bayesian hierarchical model, meaning that it estimates the likelihood of a given future result based on global knowledge of how countries' contraceptive prevalence rates have historically transitioned from low to high, and is informed by data at multiple levels (country, sub-regional, regional, global). FPET is unique in that it considers survey data, service statistics (where determined to be of adequate quality), and regional and global historical patterns of change to produce annual estimates of mCPR and unmet need. For FPET, more data points, even conflicting ones, only strengthen the model's ability to predict future trends.

FPET is a free, web-based application pre-loaded with data pulled from the United Nations Population Division (UNDP) World Contraceptive Use database.

How does FPET forecast the future?

To forecast the future, the model starts by assessing the present. That includes reviewing all available survey data and considering demographics and how a growing population will impact demand for and access to family planning services. These pieces of information are all key to predicting the future, but there is one aspect that many projection models are missing; learning lessons from the past. FPET considers historical trends and learns from real world experiences of countries as they have transitioned from low to high contraceptive prevalence, so the estimates are grounded in reality. Using this information, FPET makes a best estimate for each country about when and how quickly mCPR will increase, and at what point growth will level off. Where quality data is available, users can also include service statistics to better understand who is accessing services, which services, and where. These data provide a snapshot of current contraceptive use, but also provide insights into some areas where desires for services are unfulfilled. Because service statistics are available more regularly, they can detect more immediate changes, and help to predict shifts up or down in the trend that may deviate from the historical norm. This kind of feedback is essential for proactive program management and can accelerate progress toward family planning goals.



Photo credit: Lindsay Mgbor/DFID

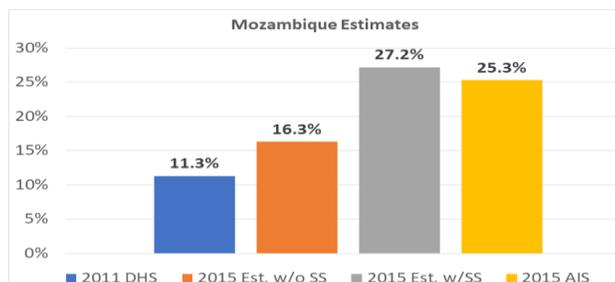
Combining inputs from DHS, other national or international surveys, the Multiple Indicator Cluster Survey (MICS), PMA2020 mobile-based surveys, and service statistics, the model can fill in data gaps and make best estimates tailored to each country’s unique context, making the FPET methodology especially helpful in instances where the available data is old, data points present conflicting narratives of change, or when only very limited data is available.

Increasing accuracy with service statistics

Another unique feature in FPET is the ability to use service statistics, which may assist early detection of trend changes that have occurred after the last survey. Significant human and financial resources go into collecting and managing service statistics, though these government data are not always leveraged to their full potential. Incorporating service statistics into FPET encourages careful data review and may spur investment in improving service statistics systems.

In most cases, using past survey data and historical trend knowledge results in accurate projections of growth. But there are cases in which a country’s growth trajectory is so far outside the historical “norm” that a projection model would not make an ambitious enough estimate. In Mozambique, the 2011 DHS reported 11.3% mCPR, and a 2015 FPET application that did not consider service statistics estimated a sizable increase to 16.3%, and a staggering 27.2% estimate with service statistics included (Fig. 1). While surprising, this dramatic jump was validated by the 2015 AIS survey which reported mCPR at 25.3%. The routinely collected service statistics were able to capture a real-time shift upward in the mCPR trend brought on by recent investments in program implementation and prioritization. A trend shift this dramatic could not have been anticipated based on historical survey data alone.

Fig. 1: Service statistics detect changes earlier

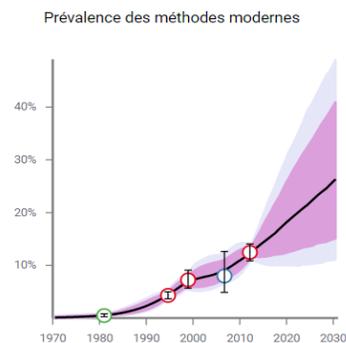


When projecting beyond documented data points into the future, generally confidence intervals widen to show increased uncertainty since the data points are now projections. Using service statistics provides additional information that reduces the uncertainty and narrows the confidence intervals. The use of service statistics has helped many countries narrow their confidence intervals, increasing stakeholder confidence in the estimates to guide planning and budgeting. In some countries the addition of service statistics has narrowed the confidence intervals significantly, from 18 to 12 points, or even 23 to just 7 points.

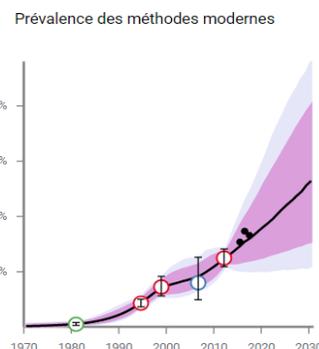
Figure 2 illustrates the difference service statistics can make to the size of confidence intervals in FPET outputs. Examples 1 and 2 show the FPET output without and with service statistics included. The grey area represents the 95% confidence interval, while the middle black line represents the median estimate of annual mCPR among married women. The colored circles indicate data points from surveys and the small black dots in Example 2 represent data points from service statistics. The narrowing of the confidence interval for future estimates is evident in Example 2, which includes service statistics.

Fig 2. Narrowing the confidence interval with service

Example 1. Without service statistics



Example 2. With service statistics



How is FPET being used?

This unique estimation tool, produced through a collaboration between the University of Massachusetts Amherst, UNPD and Track20, was developed to calculate annual estimates of mCPR, unmet need and demand satisfied by modern methods as indicators of progress for the global FP2020 initiative¹. Each year, in partnership with Track20, Ministries of Health in the 69 FP2020 focus countries calculate the estimates that are included in the FP2020 annual progress report. These national level estimates are also used by in-country stakeholders to track progress on their Costed Implementation Plans (CIPs) or other national strategies, inform programming decisions, and if sub-national data is available, Ministries can also calculate sub-national estimates to guide decentralized strategies.

Any two surveys will return slightly different results due to methodological and sampling differences, and countries trying to adjust their programming in reaction to conflicting data may be unnecessarily led off-course. In countries like Ghana, where multiple data points were telling different stories about progress (Fig. 3), FPET was able to incorporate all available data, as well as regional and global trends in growth in mCPR, to create one estimate trend, incorporating the uncertainty around the estimate and inevitable variability between surveys (Fig.4). In this case, FPET created a single narrative of progress and avoided the challenges of choosing one data point or debating the merits of the available data.

In 2015, Myanmar developed a new Costed Implementation plan for family planning. Rather than use outdated 2009 survey data to inform the strategic approach, they used FPET to estimate current and future mCPR. FPET estimated mCPR at 49.9%, a significant increase from 2005's 45.7%. When released in 2016, the new DHS validated the FPET estimate by reporting 51.3% mCPR. The FPET estimates anticipated the mCPR increase and allowed strategic planning to move ahead between surveys.

Figure 3. Ghana, all available data

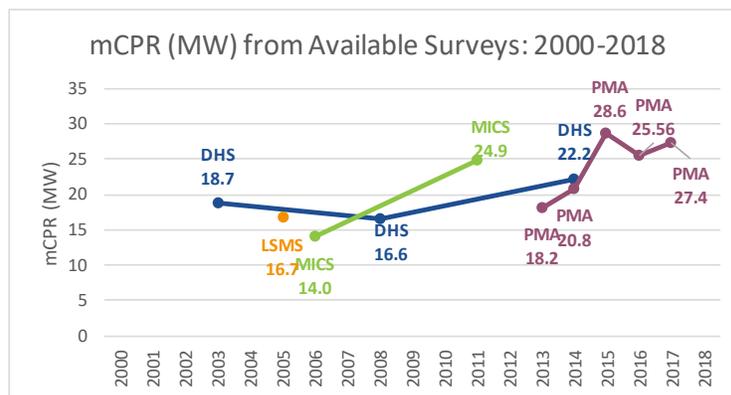
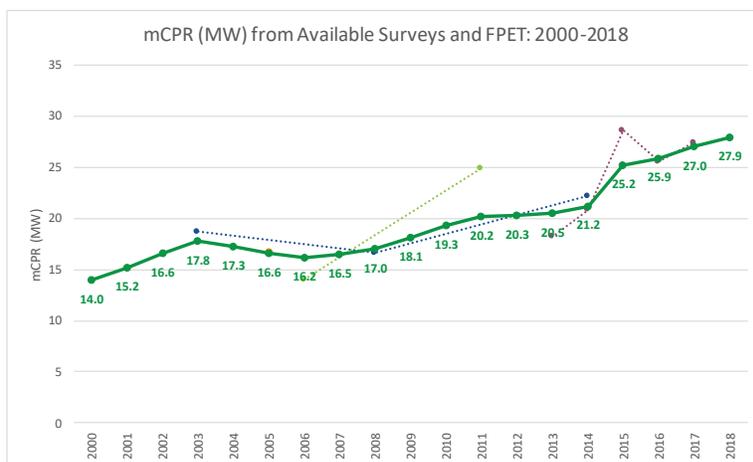


Figure 4. FPET trend informed by available data



¹ Family Planning 2020 is a global initiative through which governments, civil society, multilateral organizations, donors, the private sector, and the research

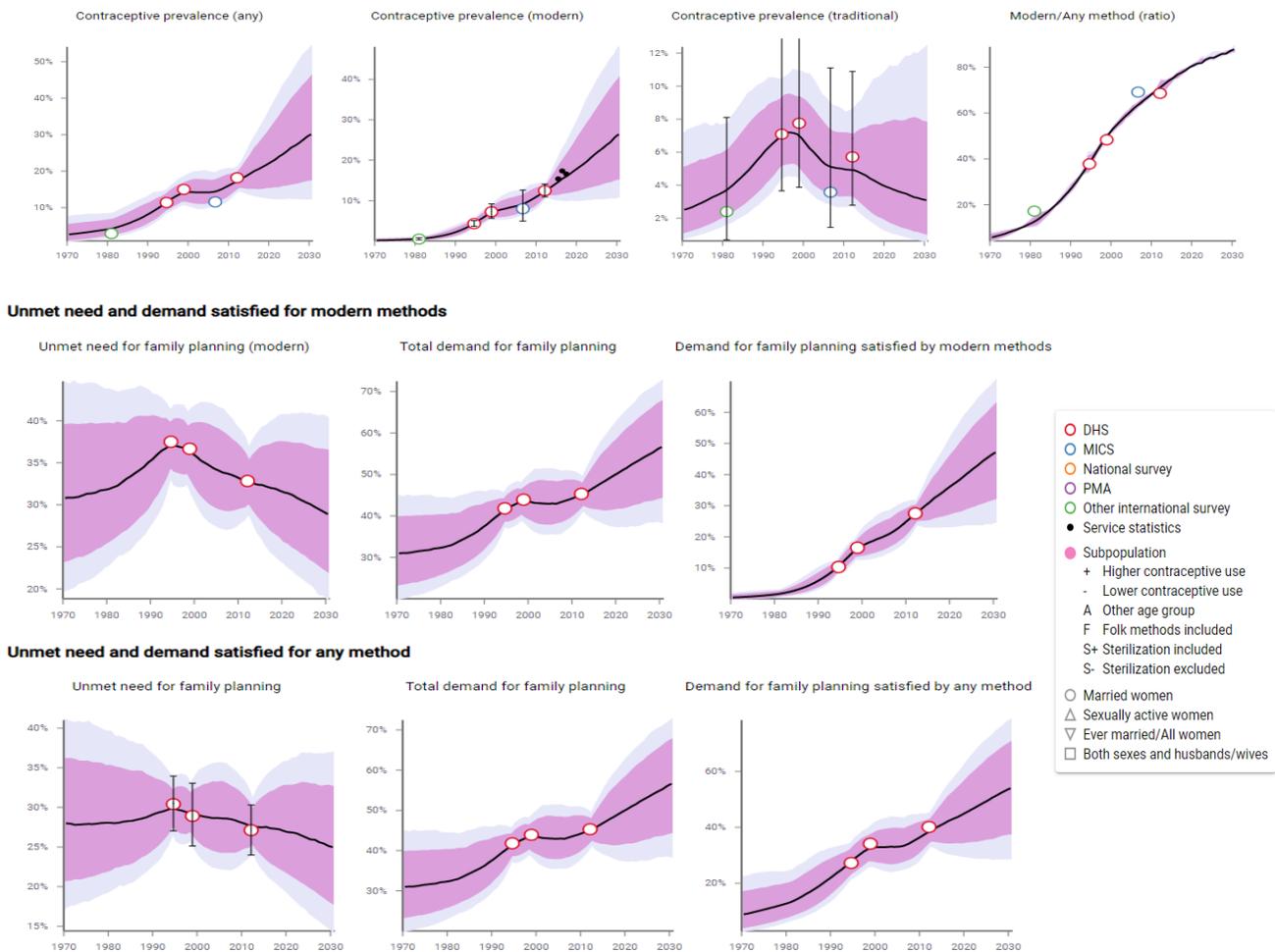
and development community work together toward a shared goal of enabling 120 million more women and girls to use contraceptives by 2020. For more on FP2020 visit <http://www.familyplanning2020.org/>

Conclusion

By combining insights from population surveys, service statistics and historical trends, FPET provides annual estimates of mCPR, unmet need, and demand for family planning satisfied by modern methods between surveys to help countries track progress and inform future programming. For an example of FPET's visual outputs, see Figure 5.

FPET is a free, web-based application available online at: <http://fpet.track20.org/fpet/>

Figure 5. Example of downloadable charts visualizing results from Burkina Faso FPET



For more information about FPET and theTrack20 project, visit <http://www.track20.org/>

CONTACT US

EMAIL: Track20@avenirhealth.org

WEB: www.Track20.org

TWITTER: @Track20project