Estimated Modern Use (EMU):
A New Service Statistics-Based Family Planning Indicator

Increases in the modern contraceptive prevalence rate (mCPR) are the ultimate indicator that a country's family planning program is making an impact. Population-based surveys, such as the Demographic Health Survey, or other national surveys are typically the source of these estimates. With these surveys-based indicators, 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.

All countries are collecting some type of routine service statistics data to track elements of their family planning program, whether those are basic indicators around the total number of family planning services provided or stock levels for logistic management, or more detailed indicators on the characteristics of family planning clients or measures of quality of care provided by family planning providers. This data is generally used for tracking program implementation based on country-specific indicators designed to respond to country-specific data systems and priorities, but this data can also be used to understand outcome-level program results. Service data can include high levels of geographic detail (sometimes disaggregated down to the facility level), allowing for better understanding of regional variation and assessment of geographic dimensions of family planning programs. Because of the frequency with which service statistics are reported, often on a monthly basis, they can be used to detect changes that occur between surveys, allowing for more real-time monitoring and the ability to more proactively adjust programming. While this data is extremely useful for tracking program priorities and program implementation at the country level, there are challenges with using this data to measure population-level changes or to compare progress across countries, including the lack of standardized service statistics indicators across countries and the potential for data entry or reporting errors at the facility, regional, or national level.

Track20 has developed a tool that converts service statistics data into one single metric, **Estimated Modern Use (EMU)**. The EMU can be used to track population-level changes in contraceptive use at regional, national, and cross-national levels. The Service Statistics to EMU (SS to EMU) tool assists the user in reviewing a country or region's service statistics, an important step in itself, and then allows them to convert that data into the EMU, which can be compared against mCPR from surveys or other models. While the EMU is meant to approximate mCPR, it is not a measure of prevalence. Instead, it is a complementary indicator that can help countries track changes in contraceptive use between surveys, and be used as a cross-country, international FP indicator.

The EMU can also be used as an input into the Family Planning Estimation Tool (FPET), which produces trended annual estimates of mCPR, based on a variety of data sources, largely population-based surveys. Including the EMU as one of those data sources allows FPET to consider service statistics in its estimation of mCPR, unmet need and demand satisfied by modern methods. For more on FPET, see Box 1.

While its role in calculating mCPR through FPET is important, the EMU metric itself, and the data review process associated with use of the SS to EMU tool, have value on their own in terms of improving data quality and use, opening dialogue between data and program staff, and providing annual tracking of changes in contraceptive use between surveys. The SS to EMU tool transforms several types of generally available service statistics data (family planning commodities distributed, family

> **Box. 1 Family Planning Estimation Tool (FPET)**
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> This innovative model uses 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. FPET combines survey data with historical knowledge about how countries transition from low to high contraceptive prevalence to estimate current and future mCPR. Service statistics can also be incorporated into the estimation process in the form of an Estimated Modern Use (EMU) metric, calculated through the SS to EMU tool. While FPET can be run without the EMU calculated from service statistics, the EMU enables more accurate estimates with narrower confidence intervals. FPET is available at no cost online at http://fpet.track20.org/fpet/.

planning visits, or family planning users) into a single, comparable metric and calculates annual growth rate and method mix. With the EMU, countries can use their own data to answer the questions, "since our last survey, has our trend slowed down, stayed the same, or accelerated," and "what does that mean for our programming and investments?"

How is EMU Different?

As metrics, the Estimated Modern Use (EMU) and Couple Years of Protection (CYP) start from a similar calculation, which is designed to estimate an aggregated impact from a variety of contraceptive commodities on providing protection against unintended pregnancy. CYPs are calculated as a direct conversion of contraceptive commodities (ex. 10 IUDs) into an indicator of the impact of those commodities (46 Couple Years of Protection). The CYP also serves as a single indicator representing the combined impact of different contraceptive methods with different levels of effectiveness and duration. The EMU calculation utilizes CYPs as a basis for estimating a population-based proportional indicator (a percentage versus a whole number), designed to be more comparable to mCPR, with a few adjustments.

SS to EMU Data Inputs:
- Service Statistics data – one or more of the following:
  - ✓ FP commodities distributed
  - ✓ FP visits
  - ✓ FP users
- Reporting coverage rate
- Population data
- FPET & Survey estimates of mCPR prevalence & FP method mix
- Public sector market share

Outputs:
- Graphics to help review quality of data and trends
- EMU for use in FPET or program monitoring

CYPs apply the full impact of Long Acting and Permanent Methods (LAPMs) in the year the method was distributed. When counted in this way, an implant, for example, would show benefit in the year it was inserted, but no impact in future years, even though it continues to provide contraceptive protection several years into the future. In the EMU calculation, that impact is distributed across the years a method would be in use, based on the standard continuation rates used to develop the CYP factors (Figure 1). This serves to smooth out trends in long-acting contraceptive use, as there may be fluctuations in the acceptance of LAPMs by clients which are unlikely to result in immediate fluctuations in use as women continue to use these methods over several years.

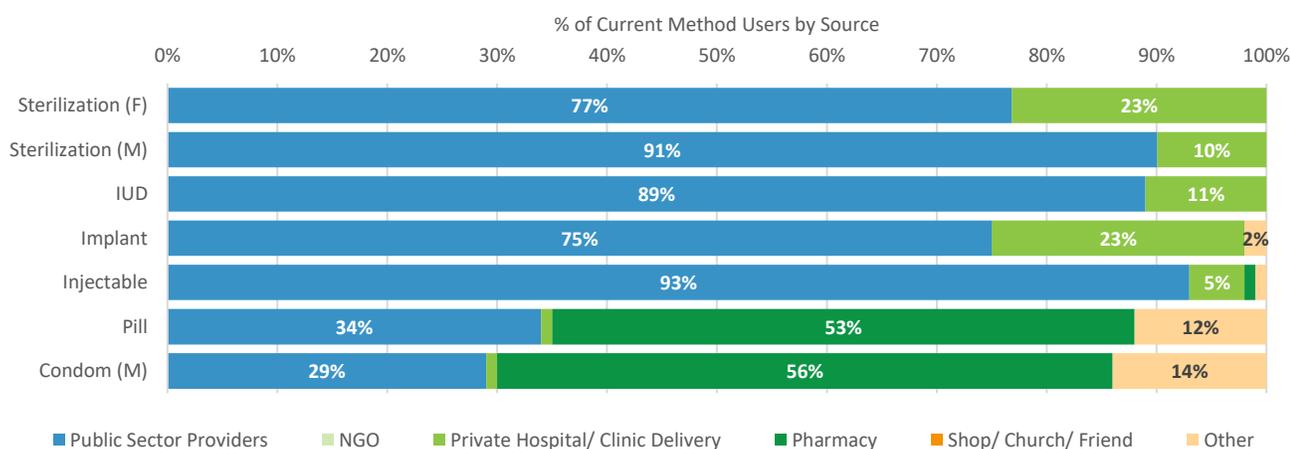Figure 1. LAPM User Continuation Trends Used in SS to EMU Tool[1]

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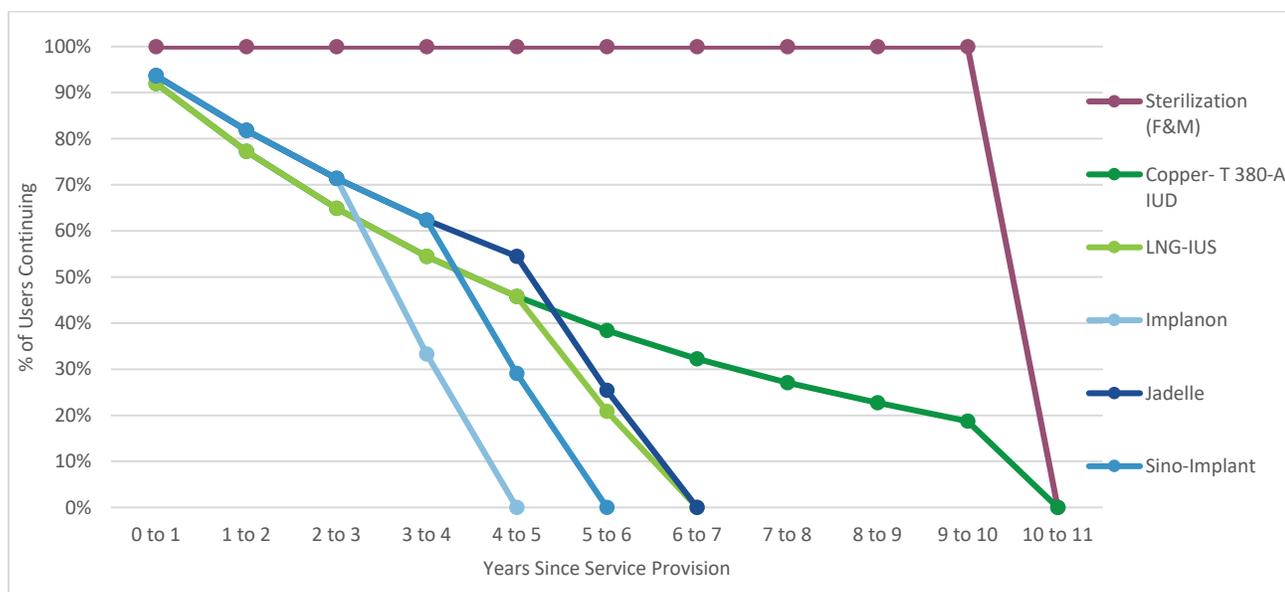
[1] Graph shows standard continuation trends, but in Bangladesh, India, and Nepal the SS to EMU tool would estimate the duration of sterilization services (tubal ligation and vasectomy) at 13 years, rather than 10, because these countries generally see earlier initiation of these methods.

The EMU also incorporates a calculation to account for women who are still using LAPMs that were provided before the current data collection period by assuming that there had been 1) consistent provision in the past, 2) lower levels of provision in the past (scaling methods), or 3) no provision in the past (for new methods). Based on this assumption and the first year of data available, the tool estimates the number of women who received long acting methods prior to the first year of data and their patterns of continuation (as shown in Figure 1). This allows the EMU to better approximate the mCPR, integrating LAPM users from prior years into the years for which data is available.

The final adjustment integrated in the EMU calculation is intended to make the EMU more representative of the full market. Traditionally, only data from public-sector facilities and programs were included in the service statistics produced by the government and, as a result, the data did not represent all sources of contraception, for example private pharmacies and shops that may be a key source of pills and condoms. The EMU calculation uses an adjustment factor, applied to the service statistics data, to attempt to account for provision in the private sector or in sectors not represented in the available data. This adjustment factor is based on data from DHS (where available) concerning source for current users of contraception, by method (Figure 2), along with user inputs estimating how much of private sector provision is captured in their data. It should be noted that over time, efforts have been made to better integrate data from private sector providers, including NGOs providing family planning services and private hospitals and clinics, so adjustments[2] can reflect those changes where relevant.

Figure 2. Distribution of Current Method Users by Source of Contraception, Philippines 2017 DHS

% of Current Method Users by Source

Method	Public Sector Providers	Private Hospital/Clinic Delivery	Pharmacy	Other
Sterilization (F)	77%	23%		
Sterilization (M)	91%	10%		
IUD	89%	11%		
Implant	75%	23%		2%
Injectable	93%	5%		
Pill	34%		53%	12%
Condom (M)	29%		56%	14%

■ Public Sector Providers　■ NGO　■ Private Hospital/ Clinic Delivery　■ Pharmacy　■ Shop/ Church/ Friend　■ Other

These three adjustments are all intended to help the EMU serve as a better proxy for mCPR, accounting for the historic provision of LAPMs prior to available data, the continued impact of LAPMs over years following the initial provision, and the provision of services in sectors not represented in the data available to the government.

Finally, because EMU is a service-based indicator and calculated annually (or quarterly), it is responsive to immediate changes in service volume. This means that the EMU will reflect trend shifts due to program scale-ups and changes long before a survey would, providing more immediate feedback.

Strengthening Service Statistics through Data Review

The first step in using the SS to EMU tool is taking a deep dive into the available service statistics. The process of review has benefits at two levels: assessing data quality and addressing issues, and once the EMU is calculated, having one metric to more regularly assess against other data sources. Service statistics must meet certain criteria across five areas of data assessment[2] before they can be input into FPET as an EMU to generate mCPR estimates, and FPET can be run without
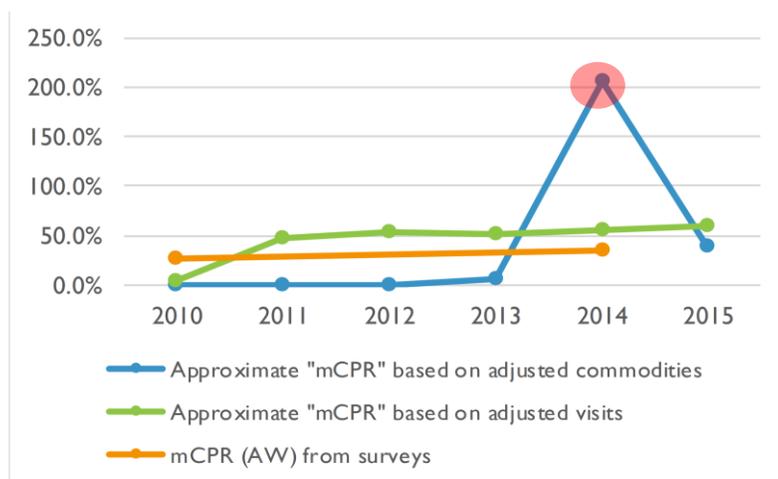
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[2] Decisions on whether to use the EMU generated from service statistics as an input to FPET are made based on factors associated with five areas of data assessment: data availability, data frequency/recency, data consistency, data quality, and data accuracy.

EMU. However, the process of data review itself is valuable, even for countries whose data do not meet the criteria in the end for FPET use.

Checking Data Quality

The first level of data review is to look for data that seem out of place. The trend in service statistics, by method, is reviewed in graphs so that outliers can be easily seen. If outliers are detected, they could signify an error in data entry, in which case the error may be traceable back to the source (e.g. facility where the data was entered) and potentially corrected. For example, review of data in Kenya showed an extreme outlier in one year where IUD distribution increased dramatically, but FP visit data showed a smoother, more moderate trend (Figure 3). This error was traced back to a specific facility where facility records indicated that a data entry error had resulted in the extremely high value reported.

Figure 3. Data anomaly caused by input error

- Approximate "mCPR" based on adjusted commodities
- Approximate "mCPR" based on adjusted visits
- mCPR (AW) from surveys

Another cause of outliers may be a misunderstanding among those completing reports at the facility level of the indicator itself and how it should be reported; in this case identifying the cause of the outliers may indicate a need for better guidance or training. This process of reviewing the quality of the data and actively following up to understand outliers demonstrates to those who spend time inputting data that someone is reviewing and using it. Acknowledgement that their effort is going toward data that is used for decision-making can incentivize improvements in data quality and management.

Some anomalies are true reflections of change. The best way to verify these is to maintain dialogue between those tasked with collection and management of data (generally HMIS team), and those working more directly on the FP program. For example, in Nigeria's Kaduna state, this process identified dramatic growth in the number of condoms distributed. The data staff may have just assumed this was a data entry error and been unable to explain the increase, but discussions between the data staff and program staff clarified that the increase was not an error, but a result of programmatic efforts to expand condom distribution in response to increased presence of military personnel in the state. In Kenya, data on a range of methods showed an uncharacteristic and sudden decline in service provision, but through discussions between data and program staff, the connection was made that the national nurse's strike had impacted services (Figure 4). In these examples, the HMIS and program staff can feel more comfortable in the interpretation and use of the data; and understanding of the cause of anomalies can limit unnecessarily reactive measures that may take the program off-course.

Country Monitoring and Evaluation Officers trained on the SS to EMU tool by Track20 regularly review service statistics data and are actively engaging with HMIS departments and with sub-national Ministry personnel to identify and resolve quality issues related to data entry. In many countries, as was the case in Nigeria and Kenya, this has either created or strengthened ties between HMIS and Reproductive Health Departments.

Figure 4. Comparing EMU and mCPR (MW) over the 2017 Kenya Nurses' Strike, Kenya, 2018

Comparing EMUs and mCPR (AW)
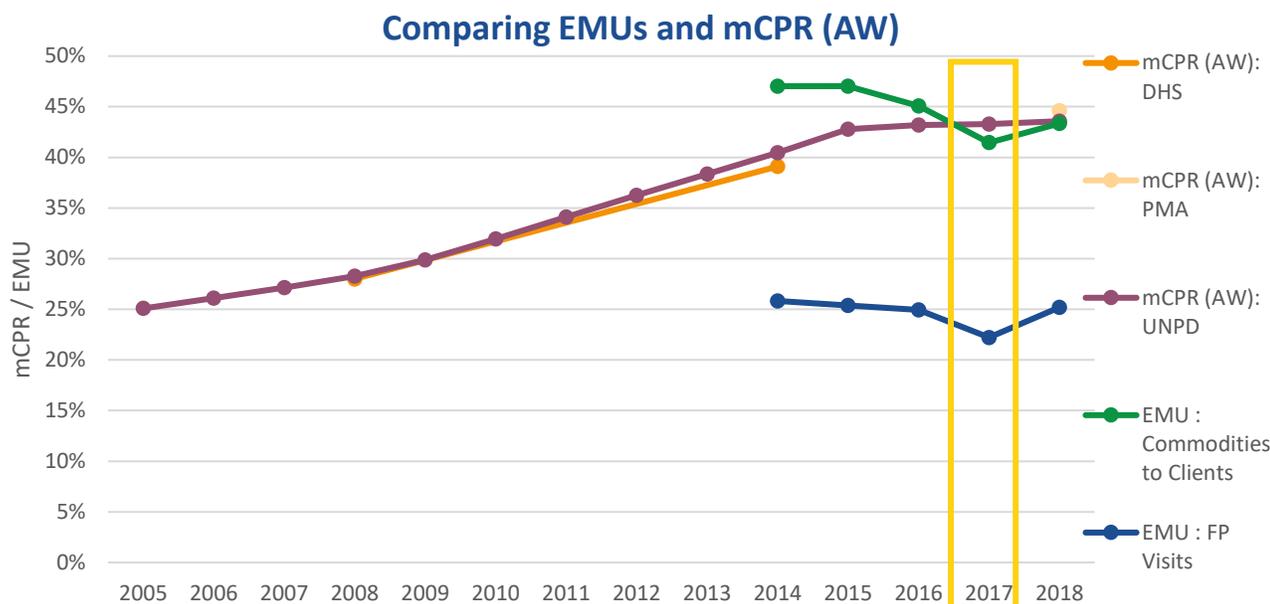
Benchmarking EMU against other Data Sources

Once the EMU is calculated, instead of a count of services or commodities, you have a single metric that you can compare to mCPR reported in surveys. This provides an opportunity to see how representative the EMU is compared to other commonly cited data sources like the Demographic and Health Surveys (DHS), Multiple Indicator Cluster Survey (MICS), and PMA2020, where available. While the specific values may not match in a given year, under ordinary circumstances the trend should be similar, and in some cases, the EMU may pick-up more recent trend changes that have occurred since the last survey. The SS to EMU tool also calculates average annual growth rate and method mix, which can also be compared across data sources (Figure 5). This benchmarking is another opportunity to "sense-check" the data and foster dialogue between the program and HMIS departments.

Figure 5. Comparing Estimated Modern Users from Service Statistics (Commodities) and Survey (2017 PMA) Ghana, 2018
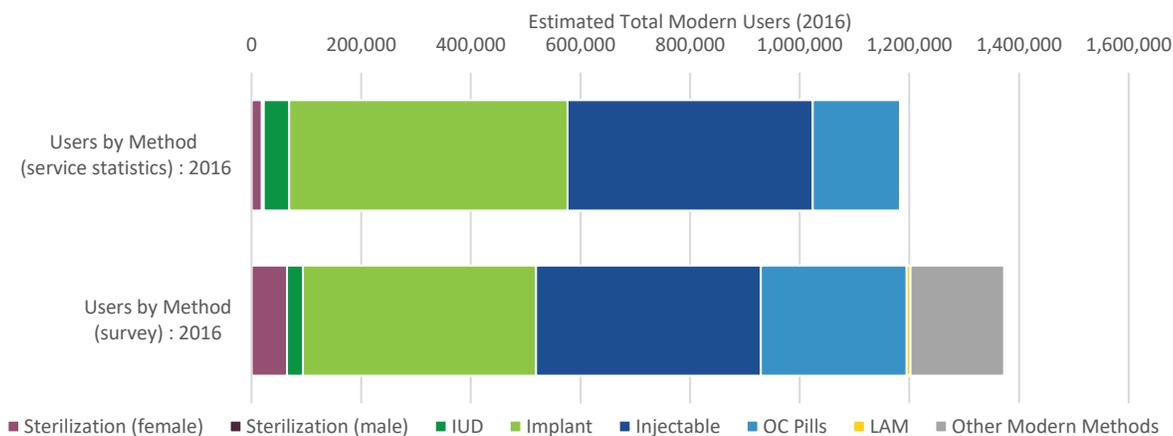
The two levels of data review, first for outliers and then between data sources, provide opportunities to improve the quality of the data, but also increase confidence in the data, and therefore increase likelihood that the data will be used for monitoring and decision-making.

Promoting the Use of Country-Owned Data

The creation of a standardized service-statistics based family planning indicator encourages countries to do more with data that is already available to them. The EMU is drawn directly from a country's own service statistics and the systems in which countries have invested heavily. This new indicator also promotes countries' ownership of data used to track their progress, both internally and by the international community. Oftentimes, decisions related to programming, both made by the countries themselves and donors, are made based on data that is calculated by others or based on estimates derived from global data.

Unlike survey data, service statistics can provide disaggregated data at much lower levels of the healthcare system, where many programmatic decisions are made. The SS to EMU tool can be applied as far down in the system as population data is available, such as a district or county, making it useful for both more frequent and geographically specific updates on family planning trends. This kind of regular, decentralized analysis and monitoring is critical as countries develop targeted strategies to overcome persistent obstacles to access.

Track20 has also created a module that can be embedded into country's HMIS to automate some of the processes for data review and conversion that Monitoring and Evaluation Officers have been doing with the SS to EMU tool. This approach prioritizes sustainability by making long-term changes to the system rather than incorporating the task into an individual's scope of work. Automating this conversion process minimizes data exporting and external manipulation and enhances quality control. The increasing number of countries requesting this embed highlights the value they see in actively assessing and analyzing their service statistics and using them to monitor programs at national and sub-national levels. There are often capacity limitations at the sub-national level, so the automation of this quality assessment process and calculation of the EMU is critical with the devolution of financing decisions.

Promoting a Standard Measure

Countries are identifying tracer indicators to help them pick up on changes and track progress toward FP goals between surveys, and to inform their RMNCH scorecards and reports to donors. A standard metric like EMU that can account for some of the nuances and biases inherent in service statistics, and be more regularly reported from a country's own data, will likely provide a better signal of progress than other HMIS-based tracer indicators currently being used. Though tracer indicators may appear similar across countries, differences in the way the data is collected, calculated, or reported may make them less comparable than they appear. If adopted more broadly, the standard methodology of the EMU can help provide a level platform on which to make comparisons across countries and geographies, and become a universally referenced indicator, much like CYP, with the benefit of more regular reporting. In addition, because the EMU can be calculated at sub-national levels, it can be particularly useful for tracking progress in specific sub-national geographies where different investments are made and would provide governments, projects, and donors, such as the GFF, with a common indicator to use across national and subnational investments.

Conclusion

The EMU is an important new service statistics-based family planning indicator that can help countries more closely monitor their own progress toward family planning goals and contribute to the field by facilitating cross-country comparisons and a standardized measure to track trends. As an input into FPET, the EMU can increase the confidence of annual estimates of mCPR, unmet need and demand satisfied by modern methods and provide early indications of changes in trends in family planning use. The two-level process of data review involved in use of the SS to EMU tool has been shown to improve the quality, management and use of family planning data for decision making. Including the EMU in the routine list of indicators collected and analyzed by countries, donors and partners, can help standardize how progress is tracked and discussed.