INTRODUCTION

Despite areas of progress in the last three decades following the 1994 International Conference on Population and Development (ICPD) convention's call for a human rights-based approach to contraception, family planning programs and policies continue to rely on metrics that run counter to a woman-centered paradigm. Ongoing debates tend to focus on approaches to expanding, extending, or replacing the metrics of modern contraceptive prevalence. Clear themes emerge from these debates, including the unknown target for maximum achievable contraceptive prevalence (Bradley & Casterline, 2014; Karra, 2022; Weinberger et al., 2017); the complexity of measuring demand, such as the 'unmet need' metric and derived 'demand satisfied' indicator of tracking success; and limited measurement of contraceptive coercion (Canning & Karra, 2023) and denial (Tumlinson et al., 2022).

Central to these debates is the need to better understand individual women's contraceptive intentions. A number of newly proposed metrics (Holt et al., 2023; Rothschild et al., 2023; Senderowicz, 2020; Senderowicz et al., 2023) rely on researchers' direct knowledge of women's desired family planning methods and timing. Data on women's intention to use (ITU) any method to avoid or delay pregnancy has emerged as a promising component to integrate into family planning measurement (Boydell & Galavotti, 2022). For instance, we can ask women whether they intend to use a method to prevent or delay pregnancy in the near future, and then follow up within the specified time frame to measure if they have actualized those intentions (Curtis & Westoff, 1997; Sarnak et al., 2023).

Cross-sectionally, it is hypothesized to be beneficial to incorporate ITU into the denominator to capture population with demand, whereas women's voices are absent in 'unmet need.' That is, women who do not intend to use contraception are not relevant or realistic for program targeting. Longitudinally, recent research also shows that women's ITU is more predictive of future use, while unmet need is largely not predictive of future use (Sarnak et al., 2023). More specifically, women with an ITU within 12 months are more likely to use contraception within that time period, but women with an ITU over a longer or unknown time period are not significantly more likely to use contraception at follow up (Sarnak et al., 2023). This demonstrates that, despite the fluctuating and malleable nature of fertility-related intentions (Magalona et al., 2023; Sennott & Yeatman, 2012; Trinitapoli & Yeatman, 2018), a time-bound measure of ITU is predictive of women's near-term contraceptive behavior. Therefore, incorporating time bound ITU into population level measurement could be an important step towards understanding true demand for contraception and creating actionable programming accordingly.

This study aims to examine measurement implications of ITU using Performance Monitoring for Action (PMA) program data in ten African and South Asian geographies. First, we compare existing cross-sectional success tracking metrics to a new metric incorporating ITU and compare concordance of ITU and unmet need in capturing population with demand. Second, we leverage longitudinal PMA data to describe changes in women's ITU and identify the extent to which, and what drives, women actualize their ITU over time. We provide commentary on the programmatic implications of each of these comparisons.

METHODS

Data and sample

We employed data from PMA, as augmented and prepared for longitudinal analysis by the Integrated Public Use Microdata Series (IPUMS). Specifically, we used PMA in ten geographies: Burkina Faso, Cote d'Ivoire, Kinshasa (Democratic Republic of the Congo), Kongo Central (Democratic Republic of the Congo), Rajasthan (India), Kenya, Niger, Kano (Nigeria) and Lagos (Nigeria). The analytical sample included 38,062 women who appeared in both baseline and one-year follow up surveys and data collected from 2019-2023.

Measuring intent to use

Given that (1) a time-agnostic measure of ITU does not predict use; and that (2) 12-month ITU is strongly predictive of use at one-year follow-up (Sarnak et al., 2023), for this report, we measured the 12-month ITU using two PMA survey questions. First is "*do you think you will use a contraceptive method to delay or avoid pregnancy at any time in the future*?" Reponses could be "*yes*," "*no,*" or "*don't know.*" Women were categorized as having ITU if they respond with "*yes*," versus those who state no/unsure intention. Respondents with ITU were further asked "*when do you think you will start using a method*?" and could specify the exact months/years they intend to use, "*soon/now*," or "*after the birth of this child*" for currently pregnant women. We considered women having 12-month ITU if they reported ITU within the next 12 months, and "*soon/now*," or "*after the birth of this child*" for currently pregnant women.

Measuring population-level success tracking metrics

We computed two existing widely used metrics among the data set: (1) contraceptive prevalence and (2) 'demand satisfied'. We then compare these metrics with a new one integrating ITU into the denominator—the percentage of current users among the sum of current users and women who express ITU within 12 months—which we term (3) '*intent satisfied*' (**Table 1**).

Table 1. Population-level success tracking metrics

Contraceptive prevalence	**'Demand satisfied'**	**'Intent satisfied'**
$\frac{\text{Current users}}{\text{All women}}$	$\frac{\text{Current users}}{\text{Current users} + \text{women assigned unmet need}}$	$\frac{\text{Current users}}{\text{Current users} + \text{women w. } 12 - \text{month ITU}}$

Measuring concordance and discordance of unmet need and intent to use

In order to understand whether unmet need correctly captures individual women's expressed demand, we assessed the concordance and discordance between women's assigned status of unmet need and their expressed intention to use. **Table 2** shows the conceptual framework of this exercise where we measure the extent to which a woman's assigned status of unmet need aligns with their expressed 12-month ITU. That is, both cell A (when a woman is assigned having no unmet need, who also expresses not intending to use within 12 months) and cell D (when the woman is assigned unmet need, who also expresses 12-month ITU) indicates 'concordance' where woman's assigned unmet need *aligns* with her expressed ITU. Cells B and C indicate 'discordance' where a woman's assigned status of unmet need does *not align* with her expressed ITU: cell B is when a woman is assigned unmet need but expresses not intending to use in 12 months, whereas cell C is when woman is not assigned unmet need but expresses intending to use in the next 12 months. We term cell B as 'upward discordance' and cell C as 'downward discordance' as these scenarios might indicate women at the risk of 'upward coercion,' i.e., unwanted family planning, and 'downward coercion,' i.e. contraceptive denial, respectively (Bullington et al., 2023; Swan et al., 2023; Tumlinson et al., 2022).

Table 2. Conceptual framework of concordance versus discordance of unmet need and intent to use

		Assigned status of unmet need	
		No	Yes
Expressed intent to use within 12 months	No	A: Concordance	B: Upward discordance
	Yes	C: Downward discordance	D: Concordance

Analytical approach

First, we leveraged cross-sectional PMA data to describe the population-level implications of ITU in terms of program success tracking metrics. Next, we described the individual-level implications of ITU in capturing demand, i.e., concordance and discordance of unmet need and ITU among baseline nonusers. We then estimated multinomial regression models examining social-demographic drivers (i.e., age, marital status, parity, past family planning history, education, wealth, and urban residence) of discordance.

Next, we leveraged longitudinal PMA data to analyze the trajectories of how women change their baseline contraceptive behaviors and intentions over time: continued users, discontinued users, and particularly the six trajectories among baseline nonusers—aspiring users, actualized users, new users without previous intent, new intenders, less certain/no longer intenders, and actualized nonusers). Because some trajectories comprised a relatively small number of women, these analyses combined all ten geographies. Lastly, we estimated multinomial regression models to examine the socio-demographic drivers of different trajectories among baseline nonusers (as ITU questions are not asked among current users), controlling for age, marital status, parity, family planning history, education, wealth, and urban residence.

RESULTS & DISCUSSION

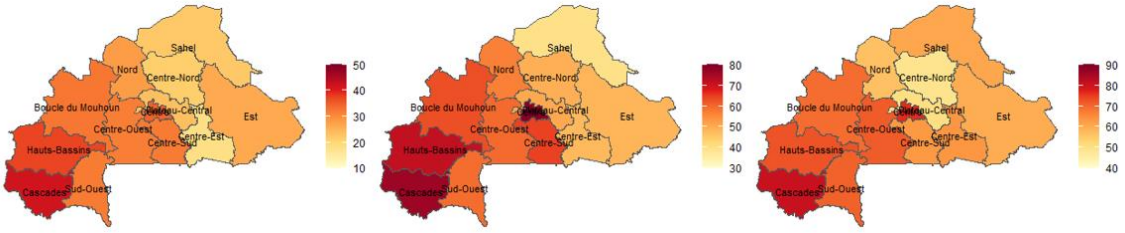
Cross-sectional evidence

Contraceptive prevalence, demand satisfied, and intent satisfied: Population-level implications

The three success tracking metrics manifest distinct regional implications for where there are opportunities for interventions. Here we use Burkina Faso as an example, as results from other geographies show similar heterogeneity in regional implications (**Figure 1**). First looking at contraceptive prevalence, Centre-Est (18%) has the lowest use. 'Demand satisfied' shows that Sahel (40%) is lowest, followed by Centre-Est, Est, Centre-Nord), and Plateau-Central (48-50%). Finally, 'intent satisfied,' however, suggests that Centre-Nord (49%) is lowest, making Sahel (61%) no longer the highest priority region for intervention. The qualitatively different

regional implications in Burkina Faso suggest discordance of women's assigned status of unmet need and ITU. Given the strong predictability of ITU versus the weak predictability of 'unmet need' on future use (Sarnak et al., 2023), these regional implications could translate to different program priorities.

Figure 1. Prevalence of contraceptive use (left), demand satisfied (middle), and intent satisfied (right) in Burkina Faso



Concordance and discordance of unmet need and intent to use: Individual-level implications

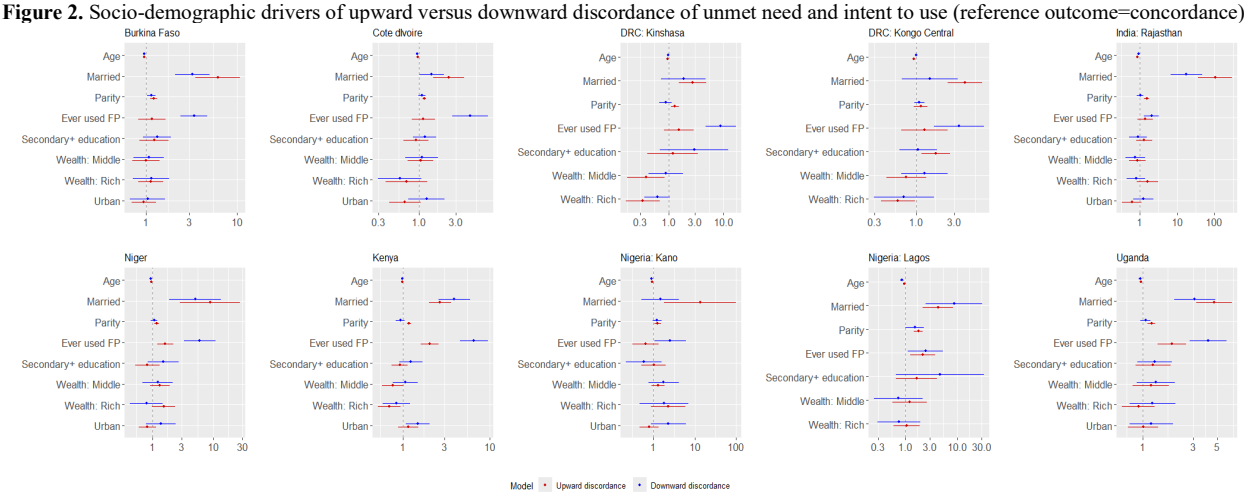
Table 3 presents the concordance and discordance of unmet need and 12-month ITU among baseline nonusers. On average, nearly one-in-four women's assigned status of unmet need does *not* align with their ITU. Across all geographies, upward discordance, i.e., women with unmet need but no ITU—accounting for nearly two-thirds of discordance—is higher than downward discordance, i.e., women with no unmet need but ITU.

Table 3. Prevalence of concordance versus discordance of unmet need and intent to use within 12 months among baseline nonusers

		Concordance			**Discordance**		
	N	Unmet need + 12-month ITU	No unmet need + no 12-month ITU	Total	**Upward**: Unmet need + no 12-month ITU	**Downward**: No unmet need + 12-month ITU	Total
Burkina Faso	3,995	10.5	60.5	71.1	16.9	12.0	29.0
Cote d'Ivoire	2,661	10.3	62.6	73.0	16.5	10.5	27.0
Kinshasa	1,070	8.2	72.0	80.2	11.7	8.2	19.8
Kongo Central	1,130	12.7	56.9	69.6	22.0	8.4	30.4
Rajasthan	2,596	4.6	79.7	84.3	10.0	5.8	15.7
Kenya	5,001	7.4	71.1	78.5	12.9	8.6	21.5
Niger	2,913	2.3	73.6	75.9	17.2	6.9	24.1
Kano	974	6.0	69.8	75.9	16.9	7.3	24.1
Lagos	855	3.0	79.0	82.0	13.6	4.5	18.0
Uganda	2,578	10.4	65.5	75.9	13.8	10.2	24.1
Total	**23,773**	**7.7**	**68.6**	**76.3**	**14.9**	**8.8**	**23.7**

Figure 2 further shows the socio-demographic drivers of discordance. Discordance is more likely to occur among women who are younger (in 9/10 geographies, except Kano), who are married (in 7/10 geographies, except Kano, Kinshasa and Kongo Central) and who have past family planning use (3/10 geographies—Kenya, Lagos, Uganda). There are also notable differences between upward and downward discordance. In most (9/10, except Kongo Central) geographies, women with higher parity are more likely to experience 'upward discordance' (red). In half of the ten geographies (Burkina Faso, Cote d'Ivoire, Kinshasa, Niger, and Kenya), 'downward discordance' (blue) is most likely to occur among women who have used family planning.

Figure 2. Socio-demographic drivers of upward versus downward discordance of unmet need and intent to use (reference outcome=concordance)



Longitudinal evidence

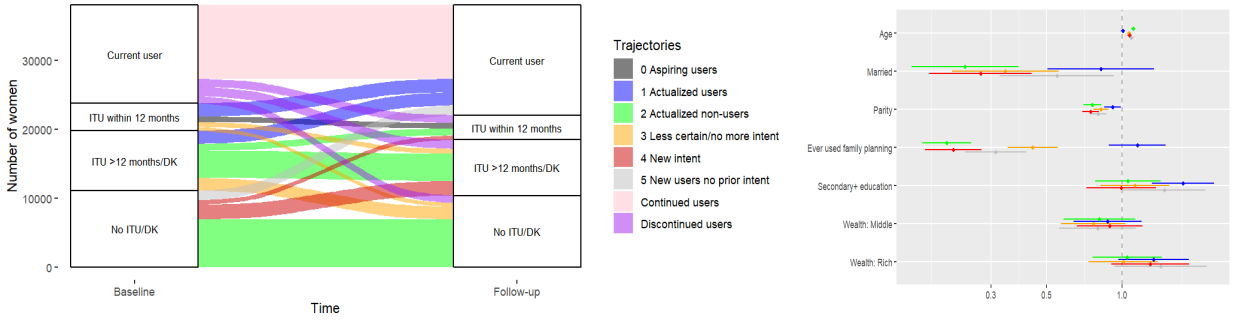
Changes in women's baseline contraceptive intentions and behaviors

Figure 3 (left panel) shows changes in women's baseline intentions and behaviors: most women (nearly 60% of the total sample) change their contraceptive behaviors and intentions during the follow-up period. We observe two trajectories among baseline users—28.2% continued users, 9.3% discontinued users—and six trajectories among baseline nonusers—2.1% aspiring users, 10.1% actualized users, 3.7% new users without previous intent, 7.3% new intenders, 8.1% less certain/no longer intenders, and 31.1% actualized nonusers This description on changes in intentions adds to the literature that has increasingly recognized the dynamic changes in women's *contraceptive* preferences (Cardona et al., 2024), behaviors (Sarnak et al., 2023), and choices (Brecker et al., 2023). Therefore, we think it is important to include ITU questions as routine indicators in population surveys to understand how contraceptive dynamics are linked to women's lives.

Socio-demographic drivers of changes in intent to use

Figure 3 (right panel) shows the drivers of six trajectories of *changes* in ITU among baseline nonusers, with 'aspiring users' being the reference and 'actualized users' in blue lines. Overall, there appears to be some similarities across trajectories, as no one single variable clearly distinguishes all six trajectories. Although no one single variable clearly differentiates all six categories, interestingly, the most sizable difference across categories is past use of family planning: both actualized and aspiring users have the highest likelihood of past family planning use, consistent with past research (O'Brien & Nur, 2024). In fact, actualized users and aspiring users are most similar to each other, as compared to other trajectories. For instance, there is no statistically significant difference between actualized users and aspiring users in terms of age, marital status, parity, past use of family planning, and wealth. Actualized users and aspiring users only differ in education: actualized users have higher education, a finding that is consistent with past research (Sarnak et al., 2024).

Figure 3. Changes in women's behaviors and ITU (left) and socio-demographic drivers of changes in ITU (right, reference=aspiring users)



Evidence on limitations of the current intent to use metric: 'No metric is perfect'

As mentioned, ITU questions are not asked among current users in PMA, as well as many other surveys, where current users are assumed to have their demand satisfied. However, our data shows the need to include ITU questions even for current users. For instance, **Figure 3** (**left panel**) shows that a nontrivial share, 30%, of current users at baseline (accounting for 9% of the sample) transition to being nonusers--whom we term 'discontinued users'—some with ITU, and some with no intent, at follow-up surveys. If changes in these women's contraceptive behaviors are not a mere function of changes in their fertility intentions, such changes might be an indicator of unsatisfactory methods (including past use) or a broad lack of access to contraceptive methods, or that prior use might have been coercive. As such, there are particularly strong programmatic values for asking women's future ITU even among current users.

Finally, we show that ITU metrics should be paired with other metrics assessing concurrent satisfaction. For instance, we observe that, in **Figure 3** (**left panel**), some women with no ITU at baseline transition to being current users at follow-up—whom we term 'new users without previous intent,' accounting for 3% of the total sample. It is unclear whether these women experience changes in their fertility and/or contraceptive intentions during the follow-up period, or whether there might be coercion. In this case, the method, measured contemporaneously, assessing the concordance between what women would like to be doing now versus what they are actually doing right now (Rothschild et al., 2023; Senderowicz, 2020) would help to delineate different possibilities.

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