TITLE
Contraceptive Concordance

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COMPETING INTERESTS
We declare that no competing interests exist, and all errors are our own.

DATA AVAILABILITY
De-identified data are available upon reasonable request. A replication dataset and code will be available on the Harvard Dataverse at XXX.

Abstract
We propose an indicator of contraceptive concordance that identifies the alignment between stated preferences for contraception and concurrent contraceptive behavior. We use this approach to estimate contraceptive concordance using data from a cross-sectional survey that was conducted with 1,958 married women in rural India. More than half of all women in our sample (51.2 percent) report that they are currently using a contraceptive method, with almost twice as many users reporting that they are using traditional methods relative to users who report using a modern method. More than 3 in 5 women (60.8 percent) were classified as wanting to use a contraceptive method at the time of the survey. We find that 60 percent of women in our sample are classified to be concordant (either concordant users or concordant non-users), while almost 1 in 4 women (24.8 percent) have an unmet need for contraception, and 15.2 percent of women in our sample are estimated to have unwanted family planning. We discuss the comparative advantages and limitations of our approach relative to other recently developed indicators.

Introduction

Progress: Slow or Stagnant?

The 1994 International Conference on Population and Development (ICPD) brought forth a shift towards a rights-based approach to family planning and reproductive health (FP/RH) policy, practice, and service delivery (1–3). Through this movement, there has been growing demand from researchers, policymakers, and practitioners to develop new FP/RH indicators that effectively embody ICPD's core mission to promote reproductive agency and well-being (4). However, current FP/RH indicators have largely fallen short (or failed altogether) to effectively reflect these goals.

Recently, there has been conceptual progress, with a consensus emerging around the need for new metrics that better reflect the principles of agency and choice in FP/RH decision-making (5–7). To this end, considerable efforts have been taken to introduce indicators that capture informed choice in contraceptive decision-making as a means to both infer the demand for family planning and estimate the extent to which such demand has been met.[1] While efforts in this space have been enthusiastic, the development and implementation of new demand-side measures have been conspicuously slow. Recent proposals to operationalize these concepts into concrete indicators remain in the early stages of development and have been limited by: 1) a lack of standardized definitions, methodologies, and objectives to measurement; 2) limited feasibility and validation across contexts and populations, and: 3) uncertainty around the extent to which such indicators can be interpreted at various levels (e.g. person-centered, program-centered, population-centered) and by various audiences (academics, practitioners, or policymakers, among others). In the absence of clear alternatives to measuring the demand for contraception (specifically) and family planning (more broadly), there is a general concern that the field will continue to rely on outdated, problematic measures that were developed prior to and have been widely critiqued since ICPD.

The Elusive Quest for Contraceptive Concordance

A key challenge to effectively measuring the demand for family planning is determining the extent to which an individual's contraceptive behavior does, in fact, align with their true preferences for contraception (9,10). Most current indicators inherently assume that contraceptive (non-)use and (dis)continuation are directly reflective of contraceptive demand; concordance between contraceptive preferences and behavior therefore follows from what is observed. However, in the absence of direct and unbiased preference elicitation, such measures risk misinterpreting observed behavior as indicative of informed and autonomous choice (11,12). This risk highlights the need for indicators that can successfully distinguish between states of contraceptive concordance (both in terms of preferred use as well as preferred non-use), states where contraceptive use persists despite preferences for non-use (unwanted family planning), and states where preferences for contraceptive use are not being realized (unmet need).

In this study, we propose an indicator of contraceptive concordance, building off of recent conceptual and empirical work that has sought to identify the alignment between stated contraceptive preferences and concurrent behavior (9,11,13–15). We develop a simple approach to elicit this indicator in routine, cross-sectional survey data, and we use this approach to estimate the prevalence of contraceptive

[1] Capturing the level of met demand for family planning through contraceptive use has been identified as a key indicator of progress in many global FP/RH programs and development agendas, including the 2012 London Summit on Family Planning and, more recently, as target 3.7 of the 2030 Sustainable Development Goals (SDGs) (8).

concordance in a sample of married Indian women. We discuss the comparative advantages and limitations of our approach relative to other recently developed indicators.

Methods

Data

We use data from a cross-sectional survey that was conducted with a sample of 1,958 women aged 18-35 who were married, lived in Jaunpur district in Uttar Pradesh, had at least one child, and were neither pregnant nor sterilized at the time of their interview.

The table below presents the survey questions and responses that were asked of all women in our sample about their current contraceptive use as well as their preferences for contraception.

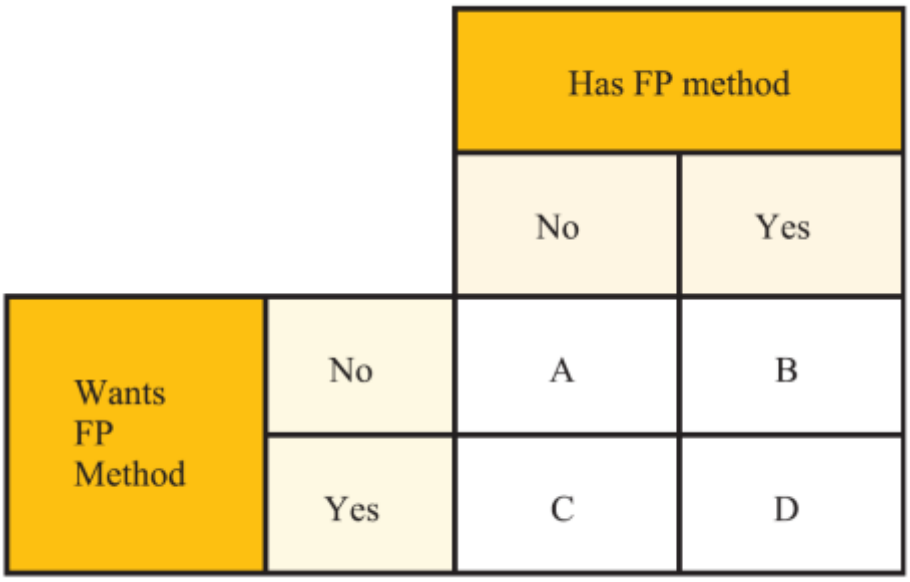
Variable	**Question**
For All Women:	
Q403: Current use of contraception	Are you currently doing something or using any method to delay or avoid getting pregnant? 1. Yes 2. No
For Current Users (Q403 = 1):	
Q414A: Wants to stop using method	If you had the choice and ability to stop using your family planning method, would you choose to stop? 1. Yes → SKIP Q414B 2. No 88. Don't Know
Q414B: Wants to switch using method IF YES: A follow-up question is asked to probe which specific method(s) the woman would like to switch to.	If you had the choice and ability to switch to another family planning method, would you choose to switch? 1. Yes 2. No 88. Don't Know
For Current Non-Users (Q403 ≠ 1):	
Q415E: Wants to start using method IF YES: A follow-up question is asked to probe which specific method(s) the woman would like to start.	If you had the choice and ability to use a family planning method, would you use a method? 1. Yes 2. No 88. Don't Know

A Measure of Concordance

Our indicator of contraceptive concordance is motivated by Senderowicz (2020)'s conceptual work on contraceptive autonomy and builds on recent theoretical and empirical studies by Holt et al (2023) and Rothschild et al (2024) to estimating preference-aligned fertility management (9,11,16). Each of these approaches fundamentally relies on the identification of concordance between contraceptive preferences and behavior, either as autonomous contraceptive use or autonomous non-use. As shown

in Figure 1, an individual's contraceptive (non-)use can be assessed against her preference for (not) using contraception, resulting in one of four possible outcomes: 1) autonomous contraceptive non-use (Box A); 2) autonomous contraceptive use (Box D); 3) unmet need for contraception (Box C); or 4) unwanted family planning (Box B). Autonomous contraceptive use and autonomous contraceptive non-use together indicate contraceptive concordance, whereby individual preferences for contraceptive (non-)use are aligned with their contraceptive behavior, resulting in a successful family planning outcome from a rights-based perspective. In contrast, discordance is identified by a) contraceptive non-users who express a preference for using contraception, resulting in an unmet need for contraception, which is currently (and imperfectly) proxied by the standard measure that is reported in Demographic and Health Surveys (DHS) (17,18), or b) contraceptive users who express a preference for non-use, resulting in unwanted family planning, which has recently been estimated as a complement to unmet need (19).

Figure 1: Contraceptive Autonomy Framework



Source: Senderowicz (2020).
Notes: If we treat the boxes as containing the proportion of women of reproductive age in each category, we can consider the contraceptive prevalence, as currently measured, as $B + D$. Contraceptive concordance, measured by autonomous use and autonomous non-use, is represented by boxes D and A, respectively. Discordance is represented either as unmet need box C, or as unwanted family planning, box B.

Our indicator of contraceptive concordance seeks to estimate each of the four boxes in the Senderowicz (2020) framework with our proposed survey questions. We first classify a woman to either be a current contraceptive user or current contraceptive non-user based on her stated response to Q403. We then classify a woman to have a stated preference for using contraception if:

Case 1: She was a current non-user and stated a preference for wanting to adopt a contraceptive method (Q403 = 2 and Q415E = 1);
Case 2: She was a current user and stated a preference for not wanting to stop her contraceptive use, but stated a preference for switching contraceptive methods (Q403 = 1 and Q414A = 2 and Q414B = 1); or

Case 3: She was a current user and stated that she neither wanted to stop her current contraceptive use nor wanted to change her current contraceptive method use (Q403 = 1 and Q414A = 2 and Q414B = 1).

By the same token, we classify a woman to have a stated preference for not wanting to use contraception if:

Case 4: She was a current non-user and stated a preference for not wanting to adopt a contraceptive method (Q403 = 2 and Q415E = 2); or
Case 5: She was a current user and stated a preference for discontinuing her method use (Q403 = 1 and Q414A = 1).

For the time being, we take a conservative approach and classify women with uncertain contraceptive preferences as not wanting to adopt that behavior; specifically, women who state that they are uncertain about whether they want to adopt/switch/discontinue contraception are classified as not wanting to adopt/switch/discontinue contraception. We take the above classifications and infer that a woman's contraceptive preferences are concordant with her behavior if a) she neither wants to stop or switch her contraceptive method, among women who are current users (**Case 3**); or b) she does not want to start a method, among women who are current non-users (**Case 4**). By the same token, we infer that a woman's contraceptive preferences are discordant with her behavior if a) if she wants to start, among women who are current non-users (**Case 1**); or b) if she wants to stop contraceptive use, among women who are current users (**Case 5**).

In following the contraceptive autonomy framework, we identify women who are classified as **Case 3** to be autonomous users (Box D in Figure 1), while women who are classified as **Case 4** are identified as autonomous non-users (Box A). We further identify the two types of discordance by stating that: a) a woman has an unmet need for contraception (Box C) if she wants to start a method and is a current non-user (**Case 1**); and b) a woman has unwanted family planning (UFP) use (Box B) if she wants to stop her method use and is a current user (**Case 5**).

In our approach, we face a challenge as to how we should classify the subset of women who are current users and want to use contraception, but who also state a preference for switching their current method (**Case 2**). Based on the 2-by-2 framework, these women would likely be classified as autonomous users (Box D) since they prefer to use contraception and are using contraception; however, an argument could be made that they have an unmet need for contraception since they are not using their preferred contraceptive method and should therefore be classified into Box B. Since the framework only considers the contraceptive use and preferences on the extensive margin (whether or not a woman is using / wants to use contraception) and not on the intensive margin (the specific contraceptive method that the woman is using / prefers), we classify women who are current users but who want to switch their choice of method to be autonomous users (Box D).

Figure 2 presents the contraceptive autonomy framework with our proposed case classifications as described above.

Figure 2: Contraceptive Autonomy Framework with Case Classifications

		Using FP Method	
		No	**Yes**
Wants FP Method	**No**	**Case 4**	**Case 5**
	Yes	**Case 1**	**Case 2, Case 3**

Results

Table 1 describes reported contraceptive preferences and behavior from our sample of 1,958 women. More than half of all women in our sample (1,003 women, or 51.2 percent) report that they are currently using a contraceptive method, with almost twice as many users reporting that they are using traditional methods relative to users who report using a modern method. More than 3 in 5 women (1,190 women, or 60.8 percent) were classified as wanting to use a contraceptive method at the time of the survey (**Cases 1 to 3**, combined), while 785 women were classified as not wanting to use a contraceptive method at the time of the survey (**Cases 4 to 5**, combined).

Among the subsample of 955 current non-users, more than half (485 women, or 50.8 percent of non-users) reported wanting to start a new method and would therefore be classified as having an unmet need for contraception (**Case 1, Box *C***), implying that 470 non-users (49.2 percent of non-users) would be classified as autonomous non-users (**Case 4, Box *A***). By the same token, the sample of 1,003 current users can be disaggregated into the subsample of 298 users (29.7 percent of users) who prefer to discontinue their method use and would therefore be classified as having unwanted family planning (**Case 5, Box *B***), or continue using contraception (705 women, or 60.3 percent of users). However, we note that among these 705 users who prefer to contracept, 114 of these users (16.2 percent) prefer to switch methods (**Case 2**), while the remaining 591 (83.8 percent) users who prefer to contracept and not switch methods would be classified as autonomous users (**Case 3, Box *D***). Table 2 presents the prevalence estimates for concordance (autonomous use and non-use), unmet need, and unwanted family planning together in the 2-by-2 contraceptive autonomy framework.

As noted, we currently classify women who prefer to switch methods to be autonomous users (**Case 2, Box *D***). recognizing that a proportion of these women may be dissatisfied with their method to the extent that some women may eventually prefer to not use contraception altogether. To provide additional insight on the types of methods that women prefer to switch from, we present the method mix distribution among the subgroup of 114 women who have a stated preference for switching (Table 3). Although our subsample is small, we note that almost half of these women in this subsample (49.1 percent) state that they would prefer to switch out of using the Rhythm method, while more than one in three women in this subsample (37.7 percent) state a preference for switching out of a male-dependent method (male condoms or withdrawal).

Taken together, we find that 60 percent of women in our sample are classified to be concordant (either concordant users or concordant non-users) if we include women who prefer to switch to be autonomous users; this estimate of concordance drops to 54.2 percent if women who prefer to switch are recategorized as being discordant.[2]

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[2] In the absence of additional information, it is not clear what type of discordance (Box B or Box C) would be most appropriate to assign women who prefer to switch their method use.

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Figures and Tables

Table 1: Descriptive Statistics

Variable	*N*	Mean	N_1
Current Use (1 = yes)	1,958	0.512	1,003
Current Use of Modern Method (1 = yes)	1,958	0.175	343
Current Use of Traditional Method (1 = yes)	1,958	0.337	660
Currently wants to use (1 = yes)	1,958	0.608	1,190
Wants to start, among non-users (1 = yes)	955	0.508	485
Wants to stop, among users (1 = yes)	1,003	0.297	298
Wants to switch methods, among users who do not want to stop (1 = yes)	705	0.162	114
Concordance between wants and use, excluding switchers as concordant users (1 = yes)	1,958	0.542	1,061
Concordance between wants and use, including switchers as concordant users (1 = yes)	1,958	0.600	1,175
Unmet need for contraception (1 = yes)	1,958	0.248	485
Unwanted FP (1 = yes)	1,958	0.152	298
N	**1,958**		

Notes: Rates are for a sample of 1,958 women aged 18-35, unweighted.

Table 2: Contraceptive Concordance 2 x 2 Table

		Using FP Method		
		No	**Yes**	**Total**
Wants FP Method	**No**	470 (24.0)	298 (15.2)	768 (39.2)
	Yes	485 (24.8)	705 (36.0)	1,190 (60.8)
	Total	955 (48.8)	1,003 (51.2)	**1,958**

Notes:

Table 3: Method Mix, among Women who Want to Switch Methods

Method	*N*	Pct.
IUD / PPIUD / Multiload for 5 Years	3	2.6
Injectables	2	1.8
Pills	4	3.5
Condom, Male	26	22.8
Standard Days Method	5	4.4
Lactational Amenorrhea Method	1	0.9
Rhythm Method	56	49.1
Withdrawal	17	14.9
Observations	**114**	

Notes:

Table 4: Method Mix, among Women who have Unwanted Family Planning

Method	*N*	Pct.
IUD / PPIUD / Multiload for 5 Years	12	4
Injectables	6	2
Pills	10	3.4
Condom, Male	108	36.2
Condom, Female	1	0.3
Standard Days Method	5	1.7
Lactational Amenorrhea Method	3	1
Rhythm Method	118	39.6
Withdrawal	34	11.4
Other Modern Method	1	0.3
Observations	**298**	

Notes:

Table 5: Method Mix, among Women who are Concordant Users (Excluding Switchers)

Method	*N*	Pct.
IUD / PPIUD / Multiload for 5 Years	8	1.4
Injectables	7	1.2
Pills	17	2.9
Condom, Male	138	23.4
Emergency Contraception	1	0.2
Standard Days Method	21	3.6
Lactational Amenorrhea Method	2	0.3
Rhythm Method	320	54.1
Withdrawal	76	12.9
Other Traditional Method	1	0.2
Observations	**591**	

Notes: