How it was, and of course, how it should be: Moving toward a better measurement of contraceptive prevalence among unmarried women

Abstract (150 words)

The family planning practices of married women have been monitored and reported uniformly, unlike those of unmarried women, a significant proportion of whom are youth. Because key data and information platforms employ different measurement approaches—different definitions of sexual recency—reports of contraceptive prevalence among unmarried women are inconsistent. We use data from the Demographic and Health Surveys (DHS) from 5 countries to ask whether a composite contraceptive use measure (i.e., current contraceptive use + contraceptive use at last sex) provides a more accurate assessment of contraceptive use among married and unmarried women. Based on our findings, we recommend that the family planning field revisit its measurement of contraceptive prevalence among unmarried women to consider a composite measure of use coupled with a 12-month sexual recency cut-off window. Having consistent or uniform denominators for measurement is key to progress toward achieving Sustainable Development Goals and tracking progress toward FP2030 goals.

Background

Global initiatives like FP2030 highlight adolescents and youth as a key subgroup whose right to accessing sexual and reproductive health services including contraception[1] is central to meeting commitments set forth by partner countries. Indeed, much progress has been made, with trend analysis of key adolescent sexual and reproductive health and rights (ASRHR) indicators at global, national, and subnational levels indicating that adolescent girls today are more likely to marry later, delay their first sexual experience, and delay their first childbirth, compared with 25 years ago; they are also more likely to use contraceptives[2], owing in part to substantial national and global investment and action.[3]

---

[1] Adolescents & Youth | Family Planning 2030 (fp2030.org)
[2] The State of Adolescent Sexual and Reproductive Health - Journal of Adolescent Health (jahonline.org)
[3] Progress in adolescent sexual and reproductive health and rights globally between 1990 and 2016: what progress has been made, what contributed to this, and what are the implications for the future? - PMC (nih.gov)

Voluntary family planning and contraceptive use has been documented as having benefits for women, children, and families, and communities[4,5,6]. Surprisingly however, the measurement of this important indicator - specifically the denominator - has not been standardized for *all* categories of women. Specifically, the family planning practices and needs of married women have been monitored and reported uniformly, but not those of unmarried women. Looking just at the 41 countries that receive family planning assistance from the United States Agency for International Development[7], the world's largest bilateral donor in this space, roughly 61% of female youth (defined here as those aged 15-24) are unmarried, compared to 37% who are married[8]. Given that a non-negligible proportion of this key demographic are unmarried, this warrants a closer look. Because key data and information platforms employ different measurement approaches—namely, different definitions of sexual recency (elaborated below)—reports of contraceptive prevalence and unmet need among unmarried women are inconsistent. Having consistent or uniform denominators for measurement is key to progress toward achieving Sustainable Development Goals, or tracking progress toward FP2030 goals among others.

To understand the implications of these inconsistencies, Fabric and Jadhav[9] compared contraceptive prevalence and unmet need estimates among married and unmarried women at various sexual recency windows (12 months, 3 months, and 1 month preceding the survey) and found that these estimates do not vary much among married women, but do for unmarried women. For the latter, contraceptive prevalence is systematically lower and unmet need is systematically higher as the sexual recency window widens. The authors posed two recommendations, the second of which is the focus of this paper. That recommendation included a suggestion for direct questions to be added to the DHS that capture contraceptive use data: (1) "The last time you had sex, did you or your partner do anything or use any method

4 [Family planning (unfpa.org)](#)
5 [Measuring contraceptive method mix, prevalence, and demand satisfied by age and marital status in 204 countries and territories, 1970–2019: a systematic analysis for the Global Burden of Disease Study 2019 - The Lancet](#)
6 [Women's empowerment and contraceptive use: Recent evidence from ASEAN countries | PLOS ONE](#)
7 [Countries | Family Planning | Global Health | U.S. Agency for International Development (usaid.gov)](#)
8 Author's calculations from DHS [STATcompiler](#)
9 [Standardizing Measurement of Contraceptive Use Among Unmarried Women - PubMed (nih.gov)](#)

to avoid or delay pregnancy?" (2) [if yes] "What method did you use?" The authors state that incorporating these questions would help to overcome measurement misalignment, thereby allowing for improved calculation of contraceptive use among unmarried women who had sex less recently and allowing for analysts to use contraceptive use data for a larger number of unmarried women. Recently, researchers used PMA data to conduct this very analysis[10], and found that married women tended to report higher levels of current contraceptive use compared to use at last sex, whereas unmarried women reported higher levels of contraceptive use at last sex. These questions have been included in the latest revision of the DHS questionnaire, allowing researchers to understand how the comparison of contraceptive use at last sex among women does or does not allow for improved calculation of contraceptive use and unmet need by marital status.

Research Question and Sub-Questions:

Does a composite contraceptive use measure (i.e., current contraceptive use + contraceptive use at last sex) provide a more accurate assessment of contraceptive use among women of reproductive age, particularly among unmarried women?

- IF YES, does a composite contraceptive use measure obviate the need to truncate contraceptive prevalence estimates among unmarried women to women who had sex in the month preceding the survey? That is, does it allow for analysts to use contraceptive use data for a larger number of unmarried women?
- IF YES, how might contraceptive prevalence estimates shift for unmarried, married, and all women in the context of a composite measure?

Data and Research Methods

This study uses data from 5 DHS surveys that administered the DHS-8 questionnaire with revised questions asked of women on use of contraceptive methods at last sex. These are: Burkina Faso, 2021, Cambodia 2021-22, Cote d'Ivoire 2021, Kenya 2022, and the Philippines 2022. We initially included Nepal 2022 in our dataset, however, the number of unmarried women was too small (N=88) for analytic purposes, leading us to omit the Nepal data. Up to an additional four surveys whose data are anticipated before March 2024 will be included in the

---

[10] Let's Talk About Sex: Improving Measurement of Contraceptive Use in Cross-Sectional Surveys by Accounting for Sexual Activity Recency - PMC (nih.gov)

final analysis. We use data from the women's standard recode datafiles (IR datafiles), which are publicly available at https://dhsprogram.com/Data/.

We stratify our analysis based on marital status and analyze currently married women and unmarried, sexually active women (who are predominantly youth) separately. Sample sizes are shown in **Table 1**. Within each group of women, we compare three measures of contraceptive use using three different thresholds of sexual recency for defining "sexually active" women.

Table 1. Analytic sample sizes. Women who are not currently pregnant and have had sexual intercourse in the past 12 months

Survey	Unmarried women (Weighted N)	Currently married women (Weighted N)
Burkina Faso 2021	1,544	9,180
Cambodia 2021-22	202	11,571
Cote d'Ivoire 2021	2,775	6,924
Kenya 2022	2,835	7,837
Philippines 2022	1,186	12,931

Contraceptive Use Measures: Our first of three measures is a measure of current use of contraception, the commonly reported measure in use in the field. The specific question is phrased, "Are you or your partner currently doing something or using any method to delay or avoid getting pregnant?" If yes, women are asked what method they are using.

The second is a measure of contraceptive use at last sex, using the new DHS-8 question, "The last time you had sexual intercourse, did you or your partner do something or use any method to delay or avoid getting pregnant?" If yes, women are asked what method they are using.

The third measure is a composite measure of women who report either current contraceptive use or used a method at last sex.

We include use of any contraceptive method, either traditional or modern. Questions on current use of contraception were asked of all non-pregnant women and questions on use at last sex were asked of all women who are not currently pregnant, and who have had sex within the last 12 months. For consistency, we restrict our analysis to women who were asked both questions, that is women who are not currently pregnant, and who have had sex within the last 12 months.

Sexual Recency Thresholds: We estimate the three measures of contraceptive use among unmarried and married women at three thresholds of sexual recency: women who have most recently had sex within the past 12 months, the past 3 months, and the past month.

Analytical strategy: We draw comparisons among the three measures of contraceptive use and different threshold of sexual recency to determine if a composite measure of contraceptive use (combining current use and use at last sex) is less sensitive to the threshold of sexual recency, with particular attention to unmarried, sexually active women. We assess the utility of each measure, considering how well it captures the full extent of women's contraceptive use and the number of women the measure can be calculated for. Our aim is to recommend a stable measure that most accurately captures unmarried women's contraceptive behavior.

Preliminary Findings

In keeping with previous findings reported by Fabic & Jadhav as well as Bell et.al., we find that sexual activity patterns vary dramatically by marital status. Relatively small proportions of unmarried women who have ever had sex report sex in the last month (ranging from a high of 43.2% in Cote d'Ivoire to a low of 4.9% in Cambodia, **Figure 1**). Meanwhile, marriage is generally a good proxy for sexual recency, with the preponderance of married women having reported sex within the previous month (**Figure 2**). Averaging across our five survey countries, ~90% (88.7-93.5%) of married women report sex within the last 3 months and ~80% report sex in the last month (76.7-82.4%). These patterns in sexual recency by marital status suggest that a composite contraceptive use measure may be of particular relevance for understanding contraceptive prevalence and use patterns among unmarried women, including by allowing for the incorporation of data from a broader subset of unmarried women whose sexual recency is beyond the typical 1 month window used for estimating contraceptive prevalence among unmarried women. Conversely, the lack of variation in sexual recency among married women suggests that a composite contraceptive use measure may have limited relevance for this subpopulation.

Digging further into the suggestion that a composite indicator may have more utility for measuring contraceptive prevalence among unmarried women, we examine contraceptive prevalence disaggregated by sexual recency (within the last 1 month, 3 months, or 12 months) and reported contraceptive use (current use, use at last sex, or a composite measure of either current use or use at last sex) (**Figure 3**). Interestingly, there are only a handful of common themes across all five study countries.

First, as simple logic dictates, the composite measure of contraceptive use is always higher than current use or use at last sex. While we see this predetermined outcome in our data, we note that the magnitude of the difference varies by country and sexual recency cut-off.

Second, among unmarried women across all five study countries, those who report sex within the last month also report the highest levels of current contraceptive use, although this group of women does not necessarily report the highest levels of contraceptive use at last sex. Specifically, in Kenya and the Philippines, use at last sex is slightly higher (~1 percentage point) among women who report sex in the previous three months.
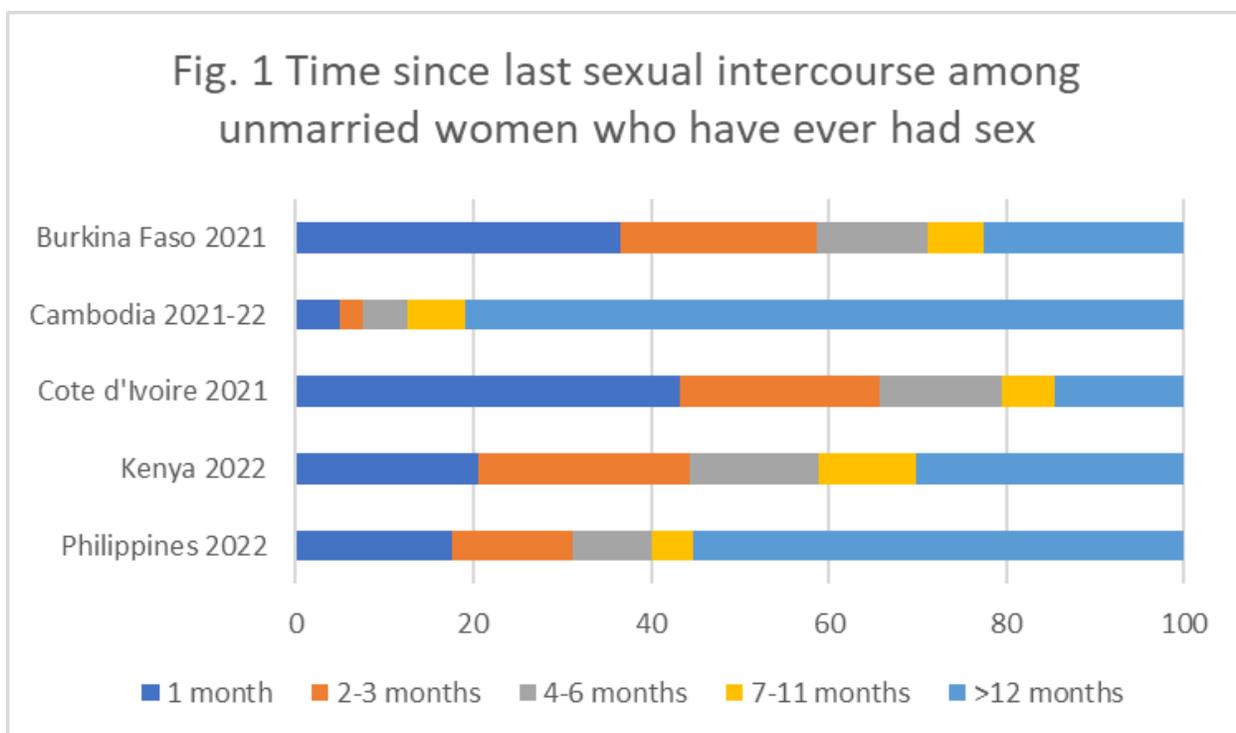
Third, compared with use at last sex and the composite contraceptive use, current contraceptive use estimates exhibit the most variability when comparing 1-month vs. 12-month estimates in each of our study countries. Current use estimates substantially lower using the 12-month sexual recency cut-off as compared to the 1-month cut-off. Again, this is in keeping with previous research on this topic.

What is particularly new and striking in our preliminary findings is that contraceptive use at last sex estimates among unmarried women are the least susceptible to changing sexual recency cut-offs. To elaborate, comparing use at last sex estimates using the 1-month vs. 12-month cut-off, we see an average reduction in prevalence of only 3.1 percentage points across our five study countries (each country weighted equally); using the current use measure, we see an average reduction of 11.1 percentage points; and using the composite measure, we see an average reduction of 5.2 percentage points. As **Figure 3** shows, however, use at last sex and current use estimates can be quite similar (as is the case in Burkina Faso) and quite different (as is the case in the Philippines). Even in Burkina Faso, where the estimates are similar, the composite measure is much higher, indicating that the women who report use at last sex are not necessarily the same as those who report current use. This finding highlights the importance of asking women about both current use and use at last sex as responses vary, even among unmarried women who recently had sex.

If we were to open the sexual recency window to 12 months, we would have much larger sample sizes to do more complex analysis among unmarried women (sample sizes ranging from nearly two to four times higher). Composite contraceptive use estimates would be lower than the estimates using the 1-month cut-off (ranging from a high of 8 percentage points lower in Cambodia to a modest 1.5 percentages points lower in the Philippines). However, they would still be higher than 1-month current use estimates, which are currently used to calculate contraceptive prevalence among unmarried women.

Moving forward with our exploration, we conducted the same analysis among married women (**Figure 4**). The picture here is clear– contraceptive prevalence among married women has extremely limited variability as the sexual recency window widens– this is to be expected since such a high proportion of married women report recent sex. Meanwhile, current contraceptive use estimates and the composite estimate are nearly identical across all five study countries, indicating that the same women who report use at last sex also report current contraceptive use. These data suggest that when measuring contraceptive prevalence among married women, the standard way that contraceptive prevalence is calculated does the job. This is in stark contrast to our findings on unmarried women.

If findings from our preliminary research coupled with other recent research continue to hold, we recommend that the family planning field revisit its measurement of contraceptive prevalence among unmarried women to consider a composite measure of use coupled with a 12-month sexual recency cut-off window.
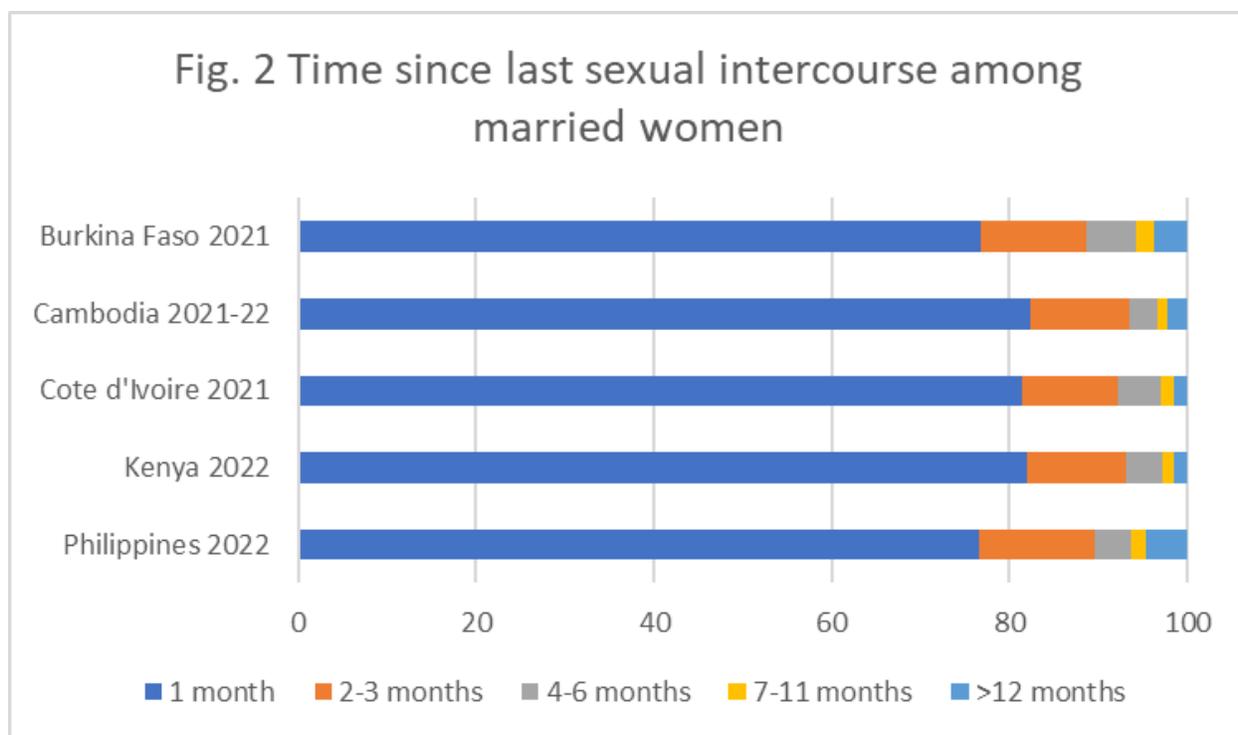

Fig. 1 Time since last sexual intercourse among unmarried women who have ever had sex

Fig. 2 Time since last sexual intercourse among married women

Figure 3. Contraceptive Use among Unmarried, Sexually Active Women by Time Since Last Sex
(current use, use at last sex, either current use or use at last sex)

Country	Sexual Re..	N
Burkina Faso	1 month	749
	3 months	1,182
	12 months	1,544
Cambodia	1 month	54
	3 months	82
	12 months	202
Cote d'Ivoire	1 month	1,436
	3 months	2,134
	12 months	2,775
Kenya	1 month	849
	3 months	1,830
	12 months	2,835
Philippines	1 month	476
	3 months	843
	12 months	1,186

Contraceptive Prevalence (Current, Last Sex, Composite) ✦

- Current Use
- Use at Last Sex
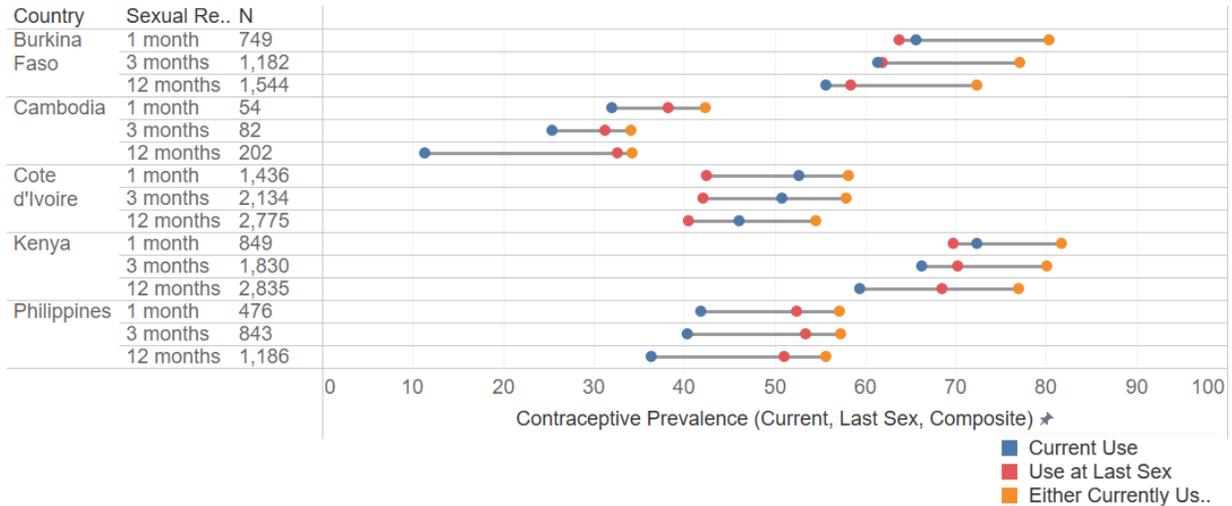- Either Currently Us..

Figure 4. Contraceptive Use among Married Women by Time Since Last Sex (current use, use at last sex, either current use or use at last sex)

Country	Sexual Re..	N
Burkina Faso	1 month	7,619
	3 months	8,627
	12 months	9,180
Cambodia	1 month	10,057
	3 months	11,257
	12 months	11,571
Cote d'Ivoire	1 month	5,812
	3 months	6,535
	12 months	6,924
Kenya	1 month	6,635
	3 months	7,463
	12 months	7,837
Philippines	1 month	10,603
	3 months	12,305
	12 months	12,931

Contraceptive Prevalence (Current, Last Sex, Composite) ✦

- Current Use
- Use at Last Sex
- Either Currently Us..