METHOD ARTICLE

Contraceptive Use Dropout-adjusted Unmet Need for Family Planning [version 1; peer review: 1 approved with reservations, 1 not approved]

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Abstract

Background: In the last two decades, unmet need for family planning in Indonesia remains stagnant, and contraceptive discontinuation has increased. These two indicators describe the risk of unwanted pregnancy in a population. Therefore, this study aims to develop an accurate calculation of the unmet need for family planning in Indonesia.

Method: The study uses 2017 IDHS data to compare unmet need at survey-time and five years preceding the survey, measured by contraceptive calendar data that measured history of contraceptive use within five years preceding the survey. Unmet need at five years preceding the survey is measured by calculating the proportion of months not using contraceptive to the duration of months exposed to pregnancy in a period of 69 months. The study population is married women in Indonesia, with a sample size of 35,681.

Results: Unmet need with contraceptive calendar calculation is higher than unmet need at survey-time. A difference of 3% concerns an additional of nearly 1.6 million unwanted pregnancies. This study proves that the high number of contraceptive discontinuations is directly proportional to higher unmet need with contraceptive calendar calculation.

Conclusion: In Indonesia, with a relatively high contraceptive discontinuation rate, the calculation of unmet need using the calendar method is more precise than at survey-time method. The study results suggest the use of unmet need calendar for countries with high contraceptive discontinuation rate and provision of primary health care that is responsive to a potential unwanted pregnancy.

Open Peer Review

Approval Status

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1. Ilene S. Speizer , University of North Carolina at Chapel Hill, Chapel Hill, USA		
2. Siswanto Agus Wilopo , Universitas Gadjah Mada, Yogyakarta, Indonesia		
Any reports and responses or comments on the article can be found at the end of the article.		

Keywords

Contraceptive calendar data, Family planning, Contraception, Contraceptive discontinuation, Unmet need.

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Introduction

Unmet need for family planning refers to those who are fecund and sexually active, but are not using any method of contraception, and report a desire to delay or limit childbearing. Women with unmet need are exposed to risk of unwanted pregnancy, unsafe abortions, and maternal death.¹ Globally, there are 80 million unwanted pregnancies and 40 million abortions every year due to unmet need.² In developing countries, around 222 million women experience unmet needs, and in Indonesia, around 1.000 births are unwanted or wanted later.^{3,4}

Referring to the history of family planning in Indonesia, in the 1970s, the family planning program was a national program aimed at population control. The indicators used were Contraceptive Prevalence Rate (CPR) and Contraceptive Years Protection (CYP), which were used to assess the decline in fertility. In 1994, the International Conference for Population & Development (ICPD) was held to introduce the concept of reproductive health and in 2012, the 2020 Family Planning was held to emphasized rights-based reproductive health.⁵ The perspective of the family planning program then has been oriented towards reproductive health and measured by the unmet need indicator to assess the risk of unwanted pregnancy which has an impact on maternal mortality.⁶ Furthermore, to achieve universal access to sexual and reproductive health and rights as a part of universal health coverage, the World Health Organization (WHO) and the United Nations Fund for Population Activities committing to strive for zero unmet need for family planning information and services, and universal availability of quality, accessible, affordable and safe modern contraceptives.⁷

The achievement of family planning programs in Indonesia based on the 1991 to 2017 DHS shows that the unmet needs are in stagnant trend in last two decades while contraceptive discontinuation has increased. Unmet needs and contraceptive discontinuation capture the same phenomenon: women who do not use contraception are at risk of unwanted pregnancies. However, the data for these two indicators show contradictions.^{8–13}

The progress of family planning program achievement becomes the basis for reviewing unmet need measurements in Indonesia. The standard of unmet need measurement is calculated based on the status of contraceptive use at survey time. This study develops an unmet need measurement based instead on contraceptive use within the five years preceding the survey which is termed the unmet need with calendar data.¹⁴ It takes into account the duration of contraceptive use, pregnancy and marriage, so conceptually the method would be more precise in estimating the risk of unwanted pregnancy in Indonesia.

Methods

The study using a cross-sectional research design by analyzing the 2017 the publicly available database of Indonesia Demographic Health Survey that conducted by National Population and Family Planning Board, Statistics Indonesia, Ministry of Health and The DHS Program or ICF. The IDHS 2017 data are considered adequate in quality for statistical analysis as the survey report has been officially published and the survey data have been used in published studies. The studied population were currently married women with total of 35,681 women.

This study used reproductive and contraceptive calendar data which records several dimension on the history of reproductive and contraceptive events, such as: 1) Birth history; 2) Pregnancy; 3) Birth termination; 4) Current contraceptive use; 5) Episodes of contraceptive use during calendar period. The study focused on duration not protected by contraceptive use, described as measured in women of reproductive age who did not use contraception in the five years preceding the survey, which in IDHS 2017 was 69 months. These measurements were made after determining the study population, which then retrospectively reviewed the history of contraceptive use at 69 months prior to the survey. The data was analyzed by SPSS version 23.0 statistical packages (IBM SPSS Statistics, RRID:SCR_019096).

The detailed calculations of duration not protected by contraceptives are shown in Figure 1.

Figure 1 explains that survey-time unmet need is measured based on contraceptive use status at the time of survey, while unmet need with calendar data is measured based on contraceptive use within the 69 months preceding the survey. The figure shows that unmet need at survey-time is limited by the marital status, which is the inclusion criteria in this study. The duration of not protected by contraceptive was carried out indirectly from calculating the duration of marriage, duration of contraceptive use, and pregnancy duration. This is to avoid the period before marriage within five years preceding the survey taken into account in the measurement.

Duration of contraceptive use is calculated by adding up the person months of contraceptive use, either modern or traditional, over a period of 69 months for each individual. Pregnancy events, live births, stillbirths, abortions and duration of marriage were calculated as the duration of pregnancy in the same way as duration of contraceptive use. The formula to calculate the duration of not protected by contraceptive use is obtained as follows:

$$\text{Duration of not protected} = \text{duration of marriage} - (\text{duration of using contraceptive} + \text{duration of pregnancy})$$

Figure 1. Illustrations of unmet need measurements at survey time and with calendar data.

Based on the formula, the calculation of unmet need with contraceptive calendar data is as shown below:

$$\text{Unmet need with calendar data} = \frac{\sum \text{Duration of not using contraceptive}}{\sum \text{Duration of marriage}} \times 100$$

Differences between calculation of unmet need at survey time and with contraceptive calendar data are explained on [Table 1](#).

Result

[Table 2](#) shows that the unmet need at survey time among married women was 10.5%, lower than unmet need with calendar data (13.1%). This difference of about 3% concerns almost 1.6 million additional women at risk of unwanted pregnancy. The magnitude of the difference depends on the contraceptive prevalence rate, method mix, and discontinuation rate in the country at the time of the survey.

Table 1. Unmet need measurements.

	<i>Unmet need at survey time</i>	<i>Unmet need with calendar data</i>
Numerator	Number of women who want to delay or limit childbearing but not using contraceptive	Number of months not protected by contraceptive
Denominator	Number of married women	Number of months married

Table 2. Pregnancy and contraceptive use among married women, IDHS 2017.

Unmet need at survey time			Unmet need with calendar data		
Contraceptive use status	n	%	Duration of contraceptive use	Person-months	%
Using contraceptive (met need)	22.696	63,6	Duration protected by contraceptive	1.381.311	62,9
Not using contraceptive but do not want to become pregnant (unmet need)	3.740	10,5	Duration not protected by contraceptive, but do not want children	287.473	13,1
Not using contraceptive but wanted children within 2 years (no need)	9245	25,9	Duration not protected by contraceptive, but wanted children within 2 years	354619	16,2
Total	35.681	100	Duration of sexually active (Total)	2.195.825	100

Figure 2. Percent duration of not protected by contraceptive on married women, IDHS 2017.

It should be noted that measurements of unmet need in the field are dynamic. Reproductive intentions as part of the calculation of unmet need are known to be unstable over the long-term, even in the span of few weeks. Fertility intentions were also unstable among a reference group of family planning users.¹⁵ This study did not assess the status of contraceptive use before pregnancy and treated the duration of pregnancy as not to have unmet need. Treating women who are pregnant or postpartum amenorrheic as not in need of family planning decreases the level of unmet need. Intendedness of pregnancies are likely to be biased as pregnant women don't generally view themselves as having unmet need, regardless whether their pregnancy was accidental.

Another finding (Figure 2) shows that average duration of not protected by contraceptive use is 30.6% meaning that unwanted pregnancy might occur in one-third of the marriage period. Only one-third of respondents used contraception in the full observation period (69 months), and 13.6% of respondents have never used contraception at all.

Discussion

Unmet need for family planning in the IDHS report was measured using point prevalence whereas in this study, it was measured using period prevalence. This aims to focus on the duration of not protected by contraceptives and at risk of unwanted pregnancy. Previous studies suggest that the measurement for standard unmet need does not reflect the percentage of women at risk of unintended pregnancy who are not using contraception, and a complementary measure of unmet need will be helpful to identify the target population in need of contraceptive services. Another research modified unmet need measurement by removing the categories of women included in standard unmet need calculation by limiting the population study to age 44 years, removing permanent (female and male sterilization) family planning users, infecund women, currently pregnant women who wanted the pregnancy, and non-pregnant women who want a child within two years.^{16,17}

This study show that the unmet need estimated at survey-time is lower than unmet need with calendar data which illustrates the risk of unwanted pregnancy more accurately in a population, but calendar data does have the potential for under-reporting and recall bias. On the other hand, the under-reported potential might show that the unmet need for family planning in the population is much higher than the results of this study.¹⁴

The measurement of unmet need with calendar data is more appropriate than standard methods in countries where contraceptive discontinuation rates are still high. This is indicated by the higher value of unmet need proportion with calendar data compared to the standard method. The study prove that contraceptive discontinuation rates are directly proportional to unmet needs using the calendar method. The results found that nearly 1.6 million additional married women in Indonesia are at risk of experiencing unwanted pregnancy.

The calculation of the duration of not protected by contraceptives was measured in women who did not use contraception in a period of 69 months based on the status of unmet need at the time of the survey, while the status of no need at the time of the survey was used to calculate the duration of not using contraception for women who wanted to become pregnant within 69 months. The duration of no need is not included as the numerator for calculating the unmet need with the calendar method. Calculation of duration with no need status or wanting to get pregnant in the study was calculated as 35% (duration not protected by contraception because you want to get pregnant divided by the total duration not protected by contraception). This result is not much different from the 2017 IDHS report which explains the contraceptive discontinuation with 'wanted to get pregnant' reason is 30%, while 70% do not want to get pregnant. Thus, the assumption of contraceptive use status during the survey, which is then used as the basis for calculating the duration of unprotected contraception, is acceptable.

Previous research stated that health reproductive age couples who had frequent unprotected sexual intercourse have a 20% chance of getting pregnant in one cycle.¹⁸ The pregnancy rates increase over time, namely 57% of women will become pregnant in the first three months and then rates increase 15% in the next three months. Another study showed that 30% of women became pregnant in first month, 50% pregnancies occurring within two months, and 80% of pregnancies occurring within six months, and for couples who do not use contraceptive method within 12 months, 85% are at risk of pregnancy.^{19,20} This study showed that 35% of women experienced discontinuation and were at risk of unwanted pregnancy. A previous study described cumulative pregnancy rate for one year after contraceptive discontinuation as 72-85% for IUDs, 75-81% for pills, 72-76% for implants, and 65-67% for injectables.²¹

Based on the above findings, it is necessary for the government of Indonesia to equip primary health care services in a way which is responsive to unwanted pregnancies. The 2019 Health Facility Research show that Indonesia only has 30.4% Puskesmas with Basic Obstetric and Neonatal Emergency Service (PONED) with Banten (59.7%) for the highest and West Papua (9.6%) for the lowest.²² Policy adjustments are needed in order to anticipate the low demand satisfied in Indonesia.

Conclusion

Unmet need of family planning is a crucial measure to assess the achievement of family planning programmes. The results show that for Indonesia context with a relatively high contraceptive discontinuation rate, the measurement of unmet need for family planning need adjustment, where using contraceptive calendar data for five years preceding the survey is more appropriate than at survey time. The results also showed that the average percentage of duration not using contraception was one-third of marriage period and at risk of unwanted pregnancies. Policy makers such as National Family Planning Coordination Board (BKKBN) and Ministry of Health need to adjust the calculation of demand satisfied considering the high contraceptive discontinuation in Indonesia. They also need to equip primary health care services with PONED in order to be responsive for unwanted pregnancy.

Declarations

Ethical approval

This article is part of a dissertation result that has received approval from the Ethics Commission for Research and Community Health Service, Faculty of Public Health, Universitas Indonesia, Letter Number 670/UN2.F10/PPM.00.02/2019, on November 13th, 2019.

Data and material availability

The underlying data for this study is owned by the DHS Program (<https://dhsprogram.com/methodology/survey/survey-display-522.cfm>). The electronic data is available from the DHS Program under its terms of use (<https://dhsprogram.com/Data/terms-of-use.cfm>). Before downloading the data, users must register as a DHS user for reasons laid out on the DHS Program website (<https://www.dhsprogram.com/data/Registration-Rationale.cfm>) and dataset access is only granted for legitimate research purposes.

Author contribution

Author 1 (BU) – Conceived of the presented idea, developed the theory and supervised the findings of this work.

Author 2 (H) – Carried out the analysis and wrote the manuscript.

Author 3 (SBP) – Verified the analytical methods and supervised the findings of this study.

Author 4 (RM) – Verified the analytical methods and supervised the findings of this study.

Author 5 (SR) – Together with Author 2, wrote the manuscript with input from all authors.

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Siswanto Agus Wilopo

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The author stated that: "the achievement of family planning programs in Indonesia based on the 1991 to 2017 DHS shows that the unmet needs are in stagnant trend in last two decades while contraceptive discontinuation has increased." This statement is the reason to develop a new method of unmet-need calculation. The existing unmet need is based on the prevalence (%) calculation while their method is based on a rate of person month calculation (rate from cohort observation). Certainly, we can have difference results due to these calculations. The unmet need calculation includes traditional method which result of low unmet need for Indonesia. Will the result show a similar unmet need when calculation is limited to modern of contraceptives method? Moreover, their model did not explain impact of the birth termination due to abortion. This information will influence the duration of not using contraception which ultimately to an unmet need. Authors need to explain why two methods are not giving same results.

Is the rationale for developing the new method (or application) clearly explained?

Partly

Is the description of the method technically sound?

Partly

Are sufficient details provided to allow replication of the method development and its use by others?

Yes

If any results are presented, are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions about the method and its performance adequately supported by the findings presented in the article?

Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Reproductive health

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

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Ilene S. Speizer

Department of Maternal and Child Health, Gillings School of Global Public Health, Carolina Population Center, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA

This study presents a novel measure of unmet need using 5-year calendar data. The authors demonstrate that the standard survey-time unmet need underestimates overall unmet need in Indonesia. While I find this to be an intriguing study, I did have a number of major and minor comments.

Major comments:

1. The authors state that unmet need between 1991 and 2017 is stagnant while discontinuation is on the rise. The values for unmet need and discontinuation over time are not presented nor is contraceptive use and method mix provided. This left me wondering if discontinuation is on the rise because of a change in method mix (i.e., transition from IUD to implants where side effects may be more common and causing discontinuation). Also, given that in 2017 unmet need is 10.5% (shown in Table 2), it is possible that it will not decline much more given that it is a research (and not individual) defined measure and women may choose not to use.
2. From my understanding of the approach to calculate the novel measure, any period when a woman is in union and not pregnant and not using has an unmet need. The authors argue that fertility intentions are fluid and thus not reliable and thus not part of the calculation; however, intentions are used for the "duration with no need measure" it seems. This seems inconsistent. Also, what time point is used for the fertility intentions in that measure – is it at the time of the current survey and then applied retrospectively? Further, in Table 2 you indicate that women do not want children (or want to delay) in the unmet need with calendar data measure presented on the right – so where does the information on fertility desires come from (and what time period)?

3. The rationale for this measure is not completely clear. Unmet need in its current form is already hypothetical and meant to be used at the aggregate and not individual level. As the authors rightly point out, there are flaws with unmet need including that it treats pregnant women with an unintended pregnancy as having an unmet need and does not reflect women's desire or intentions to use a method. But their hypothetical measure has the same problems, and others, so why develop a measure that requires a lot of data to capture (including calendar data that is not always obtained and has known flaws) and does not fix the identified problems.

Minor comments:

1. You say that your sample is currently married women (and you give a specific number of women). My guess is that this is the number of women at the time of the survey but since the analysis is by episodes and some women may have been married earlier (and not married at the time of the survey), I wasn't sure what the number of women was representing.
2. There are a lot of statements about "unwanted pregnancy" prevention and that the new measure demonstrates more women at risk of unintended pregnancy. However, this assumes that all women who are non-users want to delay or avoid childbearing and that they intend to use contraception. Many women may choose not to use contraception and then might not declare a subsequent pregnancy as unintended.
3. Details are provided on obstetric and neonatal care services but not on access to family planning services and provision of a full range of methods. Perhaps this oversight is because 100% of facilities offer family planning which would be great. But it is not clear why recommendations are made about obstetric and neonatal care based on this analysis.
4. CYP is couple years of protection (and not contraceptive years of protection).
5. The last sentence of the first paragraph of the results "The magnitude of the differences..." This is a key point, but no information is given on these key issues (see major point above).
6. The first paragraph of the discussion says that the new method is aiming to determine the duration of not protected by contraception and at risk of unwanted pregnancy, but this assumes that fertility desires are measured. It is not clear where fertility desires are coming from here.
7. The paragraph on the calculation of the duration not protected in the discussion lost me. It says it is based on the status of unmet need at the time of the survey and also mentions focusing on women who wanted to become pregnant within 69 months. I read the paragraph multiple times and am still not sure what it is demonstrating and how fertility intentions are being used (from the time of the survey and applied retrospectively?).
8. The grammar throughout this paper needs to be checked.

Is the rationale for developing the new method (or application) clearly explained?

Partly

Is the description of the method technically sound?

Partly

Are sufficient details provided to allow replication of the method development and its use by others?

Yes

If any results are presented, are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions about the method and its performance adequately supported by the findings presented in the article?

Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Demography, fertility, family planning, unintended pregnancy research.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to state that I do not consider it to be of an acceptable scientific standard, for reasons outlined above.

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