

ORIGINAL ARTICLE

The Most Effective Contraceptive Use Among Fertile Age Couples in Indonesia: Analysis of IDHS 2017

Chamy Rahmatika¹, Eliza Trisnadewi², Werman³, Masruqy Arrazy⁴

¹ Department of Health Information Management, University of Syedza Saintika, 25132 West Sumatera, Indonesia

² Department of Public Health, University Of Syedza Saintika, 25132 West Sumatera, Indonesia

³ Indonesia's National Health Insurance Agency, 25136 West Sumatera, Indonesia

⁴ Statistics Indonesia, 27118 West Sumatera, Indonesia

ABSTRACT

Introduction: The success of the family planning program is not only measured by the increase in CPR (Contraceptive Prevalence Rate) and the decrease in TFR (Total Fertility Rate). Indonesia's TFR of 2.6 shows that the family planning program has not been successful. Purpose: This study aims to determine the effectiveness rate of contraception during the first 12 months of usage based on the interval between contraception usage and pregnancy. **Materials and Methods:** This is an observational study that utilizes data from IDHS 2017 with a retrospective cohort design. The sample in this study consists of women of reproductive age who have been married and are currently using contraception, but experienced pregnancy while using contraception. The data analysis employs survival analysis, to determine the impact of the interval between contraception usage after childbirth on contraceptive failure. **Results:** The results of this study indicate that 58.2% of couples of reproductive ages in Indonesia use injectable contraception. Women using contraceptive implants (0.56) have the highest effectiveness compared to IUDs (0.75). The Kaplan-Meier curve shows that the failure rate is higher for traditional contraceptive methods such as withdrawal and periodic abstinence. **Conclusion:** The most effective contraceptive method in Indonesia, according to the IDHS is the implant. This study will provide recommendations for the management of contraception usage, policymakers, and stakeholders to educate the public in choosing the appropriate contraception methods.

Malaysian Journal of Medicine and Health Sciences (2025) 21(SUPP6):1-5. doi:10.47836/mjmhs.21.s6.1

Keywords: Contraceptive effectiveness, Contraceptive success, Contraceptive Prevalence Rate, Indonesia Demographic and Health Survey, Total Fertility Rate

Corresponding Author:

Chamy Rahmatika, SKM, MPH

Email: chamyrahmatika@gmail.com

Tel : +62 852 6343 5940

sterilization (3.4%), pills (13.6%), IUDs (3.9%), injections (31.9%), implants (3.3%), condoms (1.3%), periodic abstinence (1.3%), interrupted intercourse (2.3%), and other traditional methods (0.4%) among married women of reproductive age in Indonesia (4).

INTRODUCTION

The long journey of family planning management in Indonesia from 1970 to the present has led Indonesia to be recognized nationally and internationally for successfully controlling population issues (1,2). It is evident from the increase in contraceptive usage in 2012 and 2017. In 2012, 30,931 Indonesian women were using contraceptives, while in 2017, the number increased to 33,465(3). The methods used included

The contraceptive needs of postpartum women will be well addressed through counseling using various methods, overcoming cost barriers, and providing permanent and long-term contraceptive services at various healthcare facilities (5,6). The national family planning program in Indonesia has a policy of four visits, including checking women during the postpartum period, determining the contraceptive method to be used after the postpartum period ends, and providing family planning services for contraceptive use (6–8).

In reality, not all women in Indonesia are aware of the need to seek healthcare services, leading to a higher risk of unintended pregnancies between childbirth and the initiation of contraceptive use (9,10).

The voluntary selection of contraceptive methods by prospective contraceptive users after childbirth is one indication of effective, consistent, and proper contraceptive use, resulting in a relatively low contraceptive failure rate(11,12).

Unregulated use of birth control impacts the Total Fertility Rate (TFR) both directly and indirectly, leading to a rise in unintended pregnancies that become difficult to manage(13). Women facing such situations may resort to unsafe abortion practices, neglecting the health of the unborn baby and giving birth without healthcare professionals(6,10,11,14,15). The problem lies in inadequate family planning counseling for pregnant and postpartum women in Indonesia, leading to numerous considerations in contraceptive selection (2,9,16).

This explains the relationship between the increased contraceptive failure and the interval between contraceptive use after pregnancy, highlighting a serious issue that requires more attention(17,18). This research aims to demonstrate that one factor in unwanted pregnancies is getting pregnant while using contraceptives, resulting from the failure of contraceptive device use and the interval between contraceptive use after pregnancy (19–21). Understanding this, improving family planning services requires information on contraceptive effectiveness so that policymakers can act according to the conditions in Indonesia.

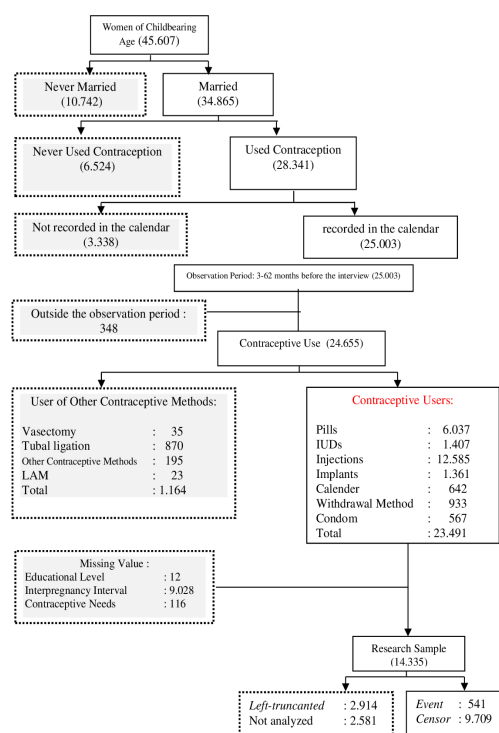
METHODS

Design and participants

This study is a type of survey research, utilizing data from the 2017 Indonesia Demographic and Health Survey (IDHS). The 2017 IDHS included 47,533 Women of Reproductive Age (WRA) aged 15-49, with a sample of 14,335 respondents, excluding certain criteria. The exclusion criteria for this study are missing responses in the education level question, no interval of contraceptive use after childbirth due to the absence of births during the observation period, and missing responses in the family planning needs question. The inclusion criteria for this study are data on women of reproductive age whose contraceptive use is fully recorded from the third to the 62nd month before the interview. Observations were made using calendar data. Calendar data refers to episodes of contraceptive use that began before the start of the observation period (62 months prior to the interview). This research is employing a cross-sectional design analyzed retrospectively as a cohort. The research was conducted from January to May 2023. Overall, the response rate for households and

individuals was relatively high. Of the 47,533 eligible women of reproductive age (15-49 years) who qualified for the interview, 96% were successfully interviewed, resulting in 45,607 women aged 15-49 years being interviewed (22).

The data analysis in this study involved survival data analysis with the determination of sensors and events as follows as Figure 1. In this study, the event is defined as pregnancy (contraceptive failure), which occurs when contraception fails, leading to pregnancy despite its use. The failure referred to is becoming pregnant during the last segment of contraceptive use within the observation period.



* Source: The 2017 IDHS Data (unweighted sample)
 * Incomplete data due to left-truncation was not analyzed because the time at risk before the study period is unknown

Figure 1: Sampling Techniques

The determination of the sensor : Episodes of modern contraceptive use without experiencing pregnancy during the observation period are considered as right-censored sensors. Episodes of contraceptive use that began before the start of the observation (62 months before the interview) and resulted in pregnancy or discontinuation of contraceptive use during the observation period (3 - 62 months before the interview) are considered events. After determining the sensor and event, there were 14,335 samples that met the criteria. This research analyzed data from the 2017 IDHS, particularly focusing on women of reproductive age who used contraceptive pills, injections, IUDs, implants, condoms, periodic abstinence, and withdrawal. The subjects involved in this survey were women of reproductive age who had ever been married and used contraception at the age of 19-45 years in Indonesia,

totaling 24.655 individuals. The analysis was conducted on variables related to contraceptive failure in married women of reproductive age in Indonesia. Inclusion and exclusion criteria reduced the number to 14.335 individuals. The inclusion and exclusion criteria applied can be seen in the subsection on research subjects and the determination of events and censoring. The sample size consisted of 9.709 individuals who did not experience contraceptive failure (censoring), 541 individuals who experienced failure (events), and 5.495 individuals who were not analyzed.

Table I: Contraceptive Effectiveness in the First 12 Months of Use Based on Contraceptive Failure

Contraceptive Methods	Pregnancy Rate per 100 Women	
	First 12 Months Pregnancy Rate (Trussell) ^a	First 12 Months Pregnancy Rate ^b
Implants	0.05	0.56
IUDs	0.8	0.75
Sterilization for Men	0.15	
Sterilization for women	0.2	
Injections	3	1.28
Pills	8	4
Condom for Men	15	7.26
Condom for women	21	
Diaphragm	16	
Periodic Abstinence	25	7.32
Withdrawal Method	27	8.93

Description:

^a Most figures from the United States

^b Source: Data processing from 2017 IDHS, unweighted data

Ethical Consideration

The ethics of this study is Informed Consent which is the process by which researches are given clear information about the purpose, procedures, risks, and benefits of the study before they agree to participate. Institutional approval for research ethics was obtained approval from the chairman of STIKES Syedza Saintika with number 015/STIKES-SS/VII/2023. This research also applies research ethics which include autonomy, beneficence, maleficence, anonymity, and justice.

RESULT

The results of this study indicate that the effectiveness of contraceptive use of IUDs and implants is higher than the use of traditional methods, injections, and pills. Table I indicates that, in Indonesia, for 100 women using condom contraceptives and experiencing pregnancy, the rate is 7.26 in the first 12 months of use.

Table I illustrates the effectiveness of contraceptive use, and this study also examined analysis of contraceptive continuation function. The analysis of contraceptive continuation was initially conducted based on the contraceptive method used. This aimed to determine patterns of contraceptive failure. Patterns of contraceptive continuation for each contraceptive method is more clearly depicted in the Kaplan-Meier curve in Figure 2.

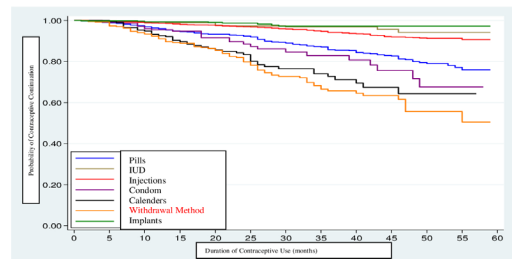


Figure 2: Kaplan-Meier Survival Curve for Contraceptive Usage by Contraceptive Method

Figure 2 shows that the seven different methods contribute to varying levels of contraceptive failure. It is evident that women using withdrawal contraception experience higher failure rates from the first to the fifth year compared to those using implants. It is concluded that women using withdrawal contraception from the first to the fifth year have the highest risk of contraceptive failure compared to other methods.

DISCUSSION

Overall, there was an increase in the prevalence of contraceptive method failure in the 2012 IDHS compared to 2017 for some contraceptive methods. The increase in failure of the calendar contraceptive method was 0.5%, while the other contraceptive methods tended to decrease or remain in failure prevalence. These contraceptives show lower pregnancy rates per 100 women compared to those using contraceptives in the United States (23). This study provides new insights into contraceptive failure in Indonesia compared to contraceptive failure rates in the United States, which will ultimately contribute to effectiveness rates in contraceptive method usage (23,25,26). This comparison was made in order to see the effectiveness of the family planning program carried out by the Indonesian government. If contraception fails, there will be an unwanted pregnancy. A decreasing failure rate will reflect the effectiveness of a contraceptive method. The results of this study indicate the highest rate of effective contraceptive use for one method, namely the implant, compared to the rate of effective contraceptive use in the United States. (5). The failure rate occurs because women using contraceptives do not use them correctly and consistently(27). Naturally, each contraceptive method works differently in the body, and the duration of use for each method varies (19). The usage of contraceptive methods by the users themselves includes methods such as pills, condoms, traditional methods, and Lactational Amenorrhea Method. Contraceptive methods used by healthcare professionals include injections, IUDs, MiniPills, and implants (21). In general, contraceptive use by women of reproductive age tends to have a higher failure rate compared to contraceptives administered with the assistance of healthcare professionals. The results of this

study indicate that injection methods have the highest rate of contraceptive use, followed by the use of pills.

The sustainability function patterns for each contraceptive method are more clearly illustrated in the Kaplan-Meier curve in Figure 2. For all seven methods, different failure rates contribute to contraceptive failure. It is observed that for women using the withdrawal method from the first year to the fifth year, the contraceptive failure rate is lower with implants compared to the other six methods: IUDs, male sterilization, female sterilization, injections, pills, male condoms, female condoms, diaphragms, periodic abstinence, and withdrawal method.

Further analysis of contraceptive methods with contraceptive failure reveals failures in each method. About one-third of respondents experienced failures with pill and injection methods. The withdrawal contraceptive method has a 15.3% failure rate among all respondents, making it the most common failure after pill and injection methods. Contraceptive failure based on contraceptive methods is more specific and can be seen in Table I.

There are significant differences between contraceptive methods in contributing to contraceptive failure, as shown in Table I and Figure 2. These differences are caused by the natural behavior of each contraceptive method, contributing to distinct contraceptive failure rates between pills, IUDs, injections, condoms, withdrawal, periodic abstinence, and implants. Methods that do not require assistance from family planning service providers tend to have higher contraceptive failure rates, such as traditional contraceptive methods like periodic abstinence and withdrawal, as well as condoms and pills. This contraception can be performed by couples of reproductive age with sufficient knowledge. If they lack good knowledge, the failure rate will increase due to improper use. In contrast, IUDs and implants, which require medical procedures for insertion or removal, tend to have lower contraceptive failure rates. IUDs and implants are types of contraception that use relatively modern methods, where there is no need for reproductive-age couples to perform the procedure themselves. Couples only need to visit a healthcare provider to check whether the contraception is safe and properly placed.

CONCLUSION

The most effective contraceptive method in Indonesia, according to the IDHS is the implant. The effectiveness rate of using the contraceptive implant method in Indonesia is ten times higher than the global standard. Women using contraceptive implants (0.56) have a higher effectiveness compared to IUDs (0.75). It is recommended to conduct continuous research to assess the success of the programs implemented by the National Population and Family Planning Agency. This

analysis relies on data collected from the 2017 IDHS. Limitations of this data include the potential for self-reporting bias, where respondents may not accurately report their contraceptive use for various reasons, such as stigma or lack of understanding. The strengths of this study include the comprehensive and relevant data, the large sample size which allows for robust and reliable statistical analysis, the diverse range of variables, and the context-specific analysis focused on Indonesia.

ACKNOWLEDGMENTS

The researcher would like to express gratitude to STIKES Syedza Saintika and the Central Statistics Agency for granting permission to use the data for analysis. Furthermore, I would like to extend my heartfelt thanks to the supervisors from University Of Gadjah Mada who have assisted in processing the data effectively.

REFERENCES

1. Rahmatika C, Helena P. Faktor Internal Pemilihan Kontrasepsi Pada Akseptor Kb Baru Di Kota Padang. In: Seminar Nasional Kesehatan Masyarakat Universitas Muhammadiyah Surakarta. 2014. p. 104–9.
2. Rahmatika C, Prawitasari S, Wilopo SA. Contraceptive use spacing after childbirth with contraception failure: IDHS 2012 analysis. *Ber Kedokt Masy.* 2018;32(8):273. <https://doi.org/10.22146/bkm.9356>
3. Statistical Yearbook of Indonesia 2020. Badan Pusat Statistik Indonesia. *Stat Indones* 2020. 2020;1101001.
4. Badan Pusat Statistik. Badan Pusat Statistik (BPS) 2022. *Stat Indones* 2022. 2022;1101001.
5. Rahmatika C, Patricia H. Dominant factors on selection of contraception toward new family planning acceptors in public health center area in Padang. *Int J Community Med Public Heal.* 2020 May 27;7(6):2100. DOI : 10.18203/2394-6040.ijcmph20202458
6. Schwandt H, Boulware A, Corey J, Herrera A, Hudler E, Imbabazi C, et al. "She is courageous because she does not care what people think about her...": attitudes toward adolescent contraception use among Rwandan family planning providers and adult female modern contraceptive users. *Reprod Health.* 2022;19(1).
7. Rahmatika C, Wilopo SA, Purwasari S. Failure contraception in Indonesia: IDHS 2012 data analysis. *Int J Community Med Public Heal.* 2019;6(6):2295. DOI : 10.1186/s12978-022-01517-4
8. Barro A, Bado AR. Religious Leaders' Knowledge of Family Planning and Modern Contraceptive Use and Their Involvement in Family Planning Programmes in Burkina Faso: A Qualitative Study in Dori in the Sahel Region. *Open Access J Contracept.* 2021;Volume 12. DOI : 10.2147/oajc.s315395
9. Nurjaeni N, Sawangdee Y, Pattaravanich U, Holomyong C, Chamrathirong A. The role of structural and process quality of family planning Care in Modern Contraceptive use in Indonesia: a

- multilevel analysis. *BMC Public Health*. 2021;21(1). DOI : 10.1186/s12889-021-11858-7
10. Azmat SK. Models to accelerate modern family planning / contraceptive services access and uptake among married women in rural Pakistan. *Asia Pacific J Public Heal*. 2013;35(8).
 11. Utomo B, Suchaya PK, Romadlona NA, Robertson AS, Aryanty RI, Magnani RJ. The impact of family planning on maternal mortality in Indonesia: what future contribution can be expected? *Popul Health Metr*. 2021;19(1). DOI : 10.1186/s12963-020-00245-w.
 12. Ahmed M, Seid A. Association between exposure to mass media family planning messages and utilization of modern contraceptive among urban and rural youth women in ethiopia. *Int J Womens Health*. 2020;12. DOI : 10.2147/IJWH.S266755.
 13. Irawaty DK, Pratomo H. Spousal communication on family planning and contraceptive adoption in Indonesia. *Indian J Public Heal Res Dev*. 2019;10(3). DOI : 10.2147/IJWH.S266755.
 14. Kassim M, Ndumbaro F. Factors affecting family planning literacy among women of childbearing age in the rural Lake zone, Tanzania. *BMC Public Health*. 2022;22(1). DOI : 10.1186/s12889-022-13103-1.
 15. Kelly L. Debates on family planning and the contraceptive pill in the Irish magazine *Woman's Way*, 1963–1973. *Womens Hist Rev*. 2021;30(6). DOI : 10.1186/s12889-022-13103-1.
 16. Kriel Y, Milford C, Cordero J, Suleman F, Beksinska M, Steyn P, et al. Male partner influence on family planning and contraceptive use: Perspectives from community members and healthcare providers in KwaZulu-Natal, South Africa. *Reprod Health*. 2019;16(1). DOI : 10.1186/s12978-019-0749-y.
 17. McCoy SI, Buzdugan R, Ralph LJ, Mushavi A, Mahomva A, Hakobyan A, et al. Unmet need for family planning, contraceptive failure, and unintended pregnancy among HIV-infected and HIV-uninfected women in Zimbabwe. *PLoS One*. 2014;9(8). DOI : 10.1371/journal.pone.0105320.
 18. Bawah AA, Sato R, Asuming P, Henry EG, Agula C, Agyei-Asabere C, et al. Contraceptive method use, discontinuation and failure rates among women aged 15–49 years: evidence from selected low income settings in Kumasi, Ghana. *Contracept Reprod Med*. 2021;6(1). DOI : 10.1186/s40834-021-00151-y.
 19. Silumbwe A, Nkole T, Munakampe MN, Cordero JP, Milford C, Zulu JM, et al. Facilitating community participation in family planning and contraceptive services provision and uptake: Community and health provider perspectives. Vol. 17, *Reproductive Health*. 2020. DOI : 10.1186/s40834-022-00210-y.
 20. Kisuza RK, Kicaber S, Bary DA, Bongomin F, Garimoi CO. Factors associated with contraceptive failure in Uganda: Analysis of the 2016 Uganda Demographic and Health Survey. *medRxiv*. 2022. DOI : 10.37506/ijfmt.v14i4.12040
 21. Farida I, Salim LA. Determination of complications and contraception failure in east java province, indonesia. *Indian J Forensic Med Toxicol*. 2020;14(4). DOI : 10.33860/jbc.v5i2.1821.
 22. Septian D, Sari N, Aryawati W. Factors for Decision to C-section Delivery in Indonesia: Insights from IDHS 2017. *J Bidan Cerdas*. 2023;5(2). DOI : 10.33860/jbc.v5i2.1821.
 23. Hubacher D, Trussell J. A definition of modern contraceptive methods. Vol. 92, *Contraception*. 2015. DOI : 10.2139/ssrn.2374636.
 24. Bloom DE, Humair S, Rosenberg L, Sevilla JP, Trussell TJ. A Demographic Dividend for Sub-Saharan Africa: Source, Magnitude, and Realization. *SSRN Electron J*. 2021; DOI : 10.1017/S1368980021004559.
 25. Paramashanti BA, Huda TM, Alam A, Dibley MJ. Trends and determinants of minimum dietary diversity among children aged 6-23 months: a pooled analysis of Indonesia Demographic and Health Surveys from 2007 to 2017. *Public Health Nutr*. 2022;25(7). DOI : 10.31965/infokes.vol20.iss1.684
 26. Sugiarti RS, Helda H, Hikmah K. Determinants of Contraceptive Use at The First Sexual Intercourse among Unmarried Adolescents in Indonesia: 2017 IDHS Analysis. *J INFO Kesehatan*. 2022;20(1). DOI : 10.31965/infokes.vol20.iss1.684
 27. Britton LE, Alspaugh A, Greene MZ, McLemore MR. An Evidence-Based Update on Contraception: A detailed review of hormonal and nonhormonal methods. Vol. 120, *American Journal of Nursing*. 2020. DOI : 10.1097/01.naj.0000654304.29632.a7.