Jurnal Bidan Cerdas
e-ISSN: 2654-9352 dan p-ISSN: 2715-9965
Volume 5 Nomor 3, 2023, Halaman 110 – 120
DOI: 10.33860/jbc.v5i3.2744
Website:https://jurnal.poltekkespalu.ac.id/index.php/JBC
Penerbit: Poltekkes Kemenkes Palu

Prevention of STI Transmission among Men Who Have Sex with Men in Indonesia through Circumcision Behavior

Mona Safitri Fatiah[1], Rispah Purba[2]
[1]Faculty of Public Health, Universitas Cenderawasih, Jayapura, Indonesia
[2]Faculty of Teacher Training and Education, Universitas Cenderawasih, Jayapura, Indonesia
Email korespondensi: mona.s.fatiah@gmail.com

ARTICLE INFO

Article History:

Received: 2023-08-05
Accepted: 2023-09-28
Published: 2023-09-30

Keywords:
Circumcision;
Sexually Transmited Diseases (STIs)
Men who have Sex with Men (MSM);
Preventive.

ABSTRACT

Introduction: The proportion of Sexually Transmitted Infections (STIs) among MSM has increased by around 0,2% from the first quarter and second quarter of 2023, for this reason, prevention efforts are needed in the form of implementing circumcision behavior among men. **Objective:** to understand the relationship between circumcision and transmission of STIs through MSM in Indonesia. **Method:** This research has a cross-sectional design with the population being men who have sex with men (MSM) across 24 provinces in Indonesia totaling 6,000 people, while the research sample is mostly MSM totaling 4,290 people with inclusion criteria being: men who are at least 15 years old, have ever had sex with men at least once in the past year, and have lived in the survey city for around one month. Samples were taken using the Respondent Driven Sampling (RDS) technique. The data used is secondary data in the form of 2018-2019 Biological Behavior Survey (STBP) data. Data in the study were analyzed using logistic regression analysis of risk factor models using STATA 14 software. **Results:** MSM who were circumcised had a 3.0 times greater chance of not having STI symptoms compared to MSM who were not circumcised (95% CI: 2.5- 3.7) after controlling for sex-buying and selling behavior. **Conclusion:** circumcision behavior is one of the efforts to prevent the spread of STI among MSM, recommending the need to create regulations regarding the importance of circumcision behavior in Indonesia.

INTRODUCTION

Sexually Transmitted Infections (STI) are one of three causes of public health problems that are a health burden throughout the world (CDC, 2022b; WHO, 2022b). In 2022, every day in the world, more than 1 million new people will be infected with STIs who do not show symptoms, whereas every year it is estimated that around 374 million new infections will be one of the four STIs, namely: Syphilis, Chlamydia, Gonorrhea and Trichomonas Vaginalis (WHO, 2022d). This number, when compared to the target desired by the World Health Organization (WHO) for 2030, which wants a reduction in new STI infections to 9.9 million per year, is certainly still very far away, so it requires great effort and synergy from various parties to be able to prevent the spread this disease (WHO, 2022a).

STI cases in the world are spread throughout almost all WHO intervention areas, one of which is the South East Asian (SEA) Region. From data compiled by WHO (2021), member countries in the SEA region have contributed a third of new STI

infections, with an estimated STI prevalence of 87%, which based on this prevalence places SEA as the region with the third highest after America (90%) and Africa (96%) (WHO, 2022c). The perpetrators contributing most to these cases are key population groups, especially the group of men who have sex with men (MSM), which is in first place with an estimated MSM prevalence of 90% (WHO, 2021a). This prevalence is certainly still far from WHO desired target of reducing the prevalence of new STI infections by 2023 to 80% (UNHCR et al., 2021). The role of several SEA member countries in the high prevalence of STIs cannot be denied, and one of the countries that contributes to the high prevalence of STIs is Indonesia.

The number of STI cases in Indonesia in the first quarter (10,954 cases) and the second quarter (13,295 cases) of 2022 shows an increase of around 2,341 cases, where the proportion of STI in risk groups, especially MSM, increased by around 0,2% from the first quarter report (15.9%) to the second quarter (16.1%) (Subdit HIV dan PMS, 2022a, 2022b). The percentage of STI in the MSM group places MSM as the first group to contribute STI cases in Indonesia in the second quarter of 2022 (Subdit HIV dan PMS, 2022b). STI indirectly facilitates the occurrence of Human Immunodeficiency Virus (HIV) through sexual contact, where STIs and HIV are responsible for 2.3 million deaths and 1.2 million people acquire cancer every year in the world (CDC, 2022b; WHO, 2022b; UNAIDS, 2021). For this reason, it is necessary to carry out further studies regarding the relationship between circumcision behavior and the spread of STI in Indonesia, especially among MSM.

The limited information related to research on the risk of circumcision behavior on the incidence of STIs in Indonesia has attracted the attention of researchers because so far there is only information related to the theory of why the process of an uncircumcised penis can be a risk for contracting STI, such as the literature study conducted by Ganeswari et al, (2020). STIs themselves are infections caused by unsafe sexual behavior, which can include: not abstinence, and not using condoms when having sex (Kemenkes, 2016).

STI and HIV not only have an impact from a health perspective but also from a political, social, and economic perspective, the impact of STIs from an economic perspective is why developed countries like America have to allocate funds of around 1.6 billion each year for medical costs for STIs patients (UNAIDS, 2021; CDC, 2022a). For this reason, prevention efforts are needed, where WHO has recommended circumcision for men, apart from being faithful to their partner, using condoms during sex, and not using shared needles for Injection Drug Users (IDUs) (Afshar et al., 2018; Peraturan Bupati Tegal Tentang Pemberdayaan Masyarakat Dalam Upaya Penanggulangan HIV Dan AIDs Di Tingkat Desa, 2016; WHO, 2018).

Circumcision is recommended, of course, not without reason, this is because during sex, the part of the preputial skin of the penis that is not circumcised will move up and down, putting the preputial mucosa at risk of exposure to infection (Ganeswari et al., 2020). A penis without a circumcision is vulnerable to sex-related wounds or abrasions, which can serve as a point of entry for microorganisms that cause STIs. Men who practice circumcision are linked to a 23% lower risk of HIV infections and STI among MSM (Afshar et al., 2018; Ganeswari et al., 2020; Gao et al., 2021). Research conducted in America also found the same thing, whereby circumcision the spread of the virus through sexual intercourse can be suppressed (Morris et al., 2017). Departing from this background, and There is little research on the role of circumcision in preventing STI in the MSM group, so this research aims to determine the relationship between circumcision behavior and the incidence of Sexually Transmitted Infections (STIs) among MSM in Indonesia.

METHODS

This research is a quantitative study with a cross-sectional research design conducted in 24 provinces in Indonesia. This research uses secondary data from the 2018 - 2019 Integrated Biological Behavioral Survey (STBP), where this research was conducted for about three months, starting March - May 2023. The population of this research is MSM who have sex with men either once, occasionally, or intensely. a total of 6,000 people spread across 24 provinces in Indonesia, while the sample in this study was 4,290 MSM people with consideration of the exclusion criteria for districts/cities which were difficult to access because regional security was not guaranteed or there were too few subjects while the inclusion criteria in this study were: a man who is at least 15 years old, has had sex with a man at least once in the last year and has lived in the survey city for roughly one month. Sampling techniques applied in the research is the Respondent Driven Sampling (RDS) method which is part of Chain Referral Sampling (CSR) which is almost the same as snowballing sampling and Network Sampling.

The variables in this study are dependent variables in the form of incidence of STIs with the operational definition being admitting that MSM has symptoms or signs of one of the 8 symptoms of STIs, in the form of: pain when urinating, warts around the genitals, warts around the anus, scabs around the genitals, scabs around the anus, scabs around the penis, and lumps around the anus. The independent variables are: circumcision behavior and the confounding variables are: respondent characteristics (age, employment, and education), information (exposure to HIV information and internet access), sexual behavior (number of sexual partners, sex-buying behavior, and sex-selling behavior), drug use, and the use of tattoos. This research was analyzed starting from univariate analysis, bivariate analysis with the chi-square test, and multivariate analysis in the form of logistic regression risk factor models which were analyzed using STATA 14 software. This research has gone through an ethical review from the University of Indonesia with number: 727/UN2.F10/PPM .00.02/2018.

RESULTS

The proportion of MSM who do not have symptoms of pain when urinating is higher than MSM who have symptoms of pain when urinating, namely 85.9%. MSM who do not have symptoms of warts around the genitals are higher than those who have symptoms, around 97.3%. The proportion of MSM who do not have warts around the genitals is higher than those who have warts around the genitals, namely 97.6%. The proportion of MSM who do not have wounds around the genitals, do not have scabs around the anus, do not have abnormal discharge from the penis, do not have abnormal discharge from the anus, and do not have lumps around the anus are higher than those who have symptoms with the same percentage, namely: 97.4%; 98.3%; 94.5%; 98.8%, and 98.6% as seen in Table 1.

The proportion of circumcised MSM who did not have STI symptoms was 81.5% higher compared to circumcise MSM who had STI symptoms. The proportion of MSM between the ages of 15–19 years who do not have STI symptoms is less than those who have STI symptoms at 77.5%. The proportion of MSM whose educational background has completed academic education/PT does not have STI symptoms, which is higher than those who have STI symptoms, namely 77.0%. The proportion of MSM who work with a regular salary and do not have STI symptoms is higher compared to MSM who work with a regular salary and have STI symptoms, at 81.9%. In the information exposure variable, the proportion of MSM who were exposed to

HIV/AIDS information and did not have STI symptoms was higher than those who had STI symptoms, around 79.2%. These results can be seen in Table 2.

The proportion of MSM who frequently access the internet and do not have STI symptoms is higher than the proportion of MSM who have STI symptoms, around 78.7%. The proportion of MSM who have less than 2 sexual partners a week who do not have STI symptoms is higher than those who have symptoms, namely 78.8%. There are more MSM who have never purchased sex and do not have STI symptoms than those who have STI symptoms, around 80.1%. The proportion of MSM who sell sex and do not have STI symptoms is around 80.7% compared to those who have STI symptoms. The proportion of MSM who use drugs and do not have STI symptoms is higher (79.6%) compared to MSM who have symptoms. The proportion of MSM who have tattoos and do not have STI symptoms is higher (80.8%) than those who have STI symptoms. These results can be seen in Table 2.

Table 1. Distribution of Symptoms of Sexually Transmitted Infections (STIs) among Men Who Have Sex with Men (MSM) in Indonesia (STBP Data Analysis 2018 – 2019)

STI symptoms	Have no symptons		Have symptoms	
	n	%	n	%
Very painful (like burning) when urinating	3,684	85.9	606	14.1
Warts around the genitals	4,172	97.3	118	2.7
Warts around the anus	4,187	97.6	103	2.4
Wounds or scabs around the genitals	4,178	97.4	112	2.6
Wounds or scabs around the anus	4,219	98.3	71	1.7
Abnormal discharge from the genitals	4,054	94.5	236	5.5
Abnormal discharge from the anus	4,240	98.8	50	1.2
Lump/swelling around the anus	4,230	98.6	60	1.4

The proportion of MSM who acknowledged having undergone circumcision was greater than MSM who had not been circumcised which is around 86.4%, as seen in Figure 1.

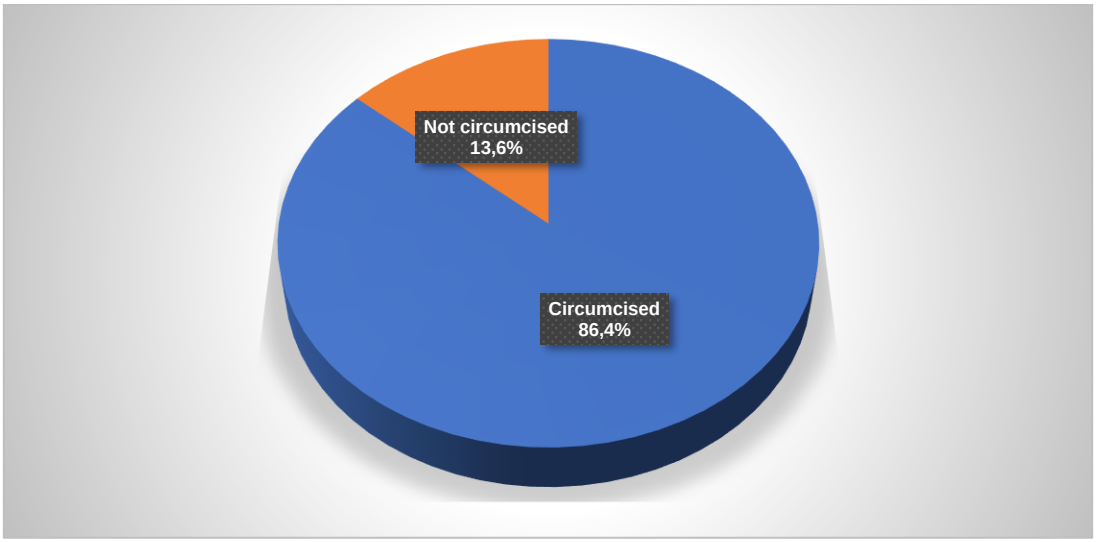

Figure 1. Distribution of MSM based on Circumcision Behavior in Indonesia (STBP Data Analysis 2018-2019).

Table 2. Distribution of Circumcision Behavior, Characteristics, Information, Sexual Behavior, Drug Use and Tattoo Use among Men Who Have Sex with Men (MSM) in Indonesia (STBP Data Analysis 2018 – 2019)

Variables	STI				p-*value*
	No		Yes		
	n	%	n	%	
Circumcision behavior					0,001
Yes, circumcised	3.036	81,5	688	18,5	
Not circumcised	353	60,6	229	39,4	
Characteristics of MSM					
Age in years					0,001
15 – 19	580	77,5	168	22,5	
20 – 24	950	76,3	295	23,7	
25 – 49	1.738	80,5	421	19,5	
≥ 50	121	90,3	13	9,7	
Education					0,023
Completed Academic/Higher Education	490	77,0	146	23,0	
Completed high school/ the equivalent	2.051	79,6	527	20,4	
Completed junior high school/ the equivalent	605	79,4	157	20,6	
Completed primary school/ the equivalent	230	78,2	64	21,8	
No school	13	81,3	3	18,8	
Work					0,001
Working with a regular salary	1.264	81,9	279	18,1	
Working with an irregular salary	631	83,9	121	16,1	
Freelance	600	73,8	213	26,2	
Not working	894	75,9	284	24,1	
Information					
Exposure to HIV/AIDS information					0,147
Exposed	2.687	79,2	706	20,8	
Not exposed	702	78,6	191	21,4	
Internet access					0,345
Yes, often	2.705	78,7	732	21,3	
Sometimes	327	77,7	94	22,3	
Never	357	83,4	71	16,6	
Risky sexual behavior					
Number of sexual partners during the week					0,023
≤2 people	2.946	78,8	794	21,2	
>2 people	442	81,1	103	18,9	
Sex buying behavior from men					0,001
Never have	3.029	80,1	754	19,9	
Have	360	71,6	143	28,4	
Sex selling behavior with men					0,001
Never have	2.593	80,7	621	19,3	
Have	796	74,3	276	25,7	
Drug use in the last 3 months					0,001
Never have	3.083	79,6	788	20,4	
Have	306	73,7	109	26,3	
Tattoo behavior					0,201
Never have	2.900	80,0	725	20,0	
Have	489	74,0	172	26,0	

MSM who are circumcised are 2.8 times more likely to not have STI symptoms compared to MSM who are not circumcised (p-value: 0.001 with AOR value: 2.8 and 95% CI value: 2.51 – 3.66) after being controlled by other variables seen in Table 3.

Table 3. Logistic Regression Results of Risk Factor Model Influence of circumcision on the incidence of STIs among MSM in Indonesia in 2018 - 2019

Variables	Incidence of STIs		
	Final Modeling		
	p-*value*	AOR	95% CI
Circumcision Behaviour			
Yes, circumcised	reff		
Not circumcised	0,001	2,8	2,3 – 3,4
Age in years			
15 – 19	reff		
20 – 24	0,049	1,3	1,0 – 1,6
25 – 49	0,817	1,0	0,8 – 1,3
≥50	0,020	0,5	0,3 – 0,9
Education			
Completed Academic/Higher Education	reff		
Completed high school/ the equivalent	0,084	0,8	0,7 – 1,0
Completed junior high school/ the equivalent	0,162	0,8	0,6 – 1,1
Completed primary school/ the equivalent	0,686	0,9	0,6 – 1,3
No school	0,686	0,8	0,2 – 2,8
Work			
Working with a regular salary	reff		
Working with an irregular salary	0,381	0,9	0,7 – 1,2
Freelance	0,001	1,5	1,2 – 1,8
Not working	0,010	1,3	1,1 – 1,6
Exposure to HIV/AIDS information			
Exposed	reff		
Not exposed	0,147	1,2	0,9– 1,4
Internet access			
Yes, often	reff		
Sometimes	0,634	1,1	0,8 – 1,4
Never	0,419	0,9	0,7 – 1,2
Number of sexual partners during the week			
≤2 people	reff		
>2 people	0,023	0,8	0,6 – 0,9
Sex buying behavior from men			
Never have	reff		
Have	0,001	1,5	1,2– 1,9
Sex selling behavior with men			
Never have	*reff*		
Have	0,001	1,5	1,2–1,8
Drug use in the last 3 months			
Never have	*reff*		
Have	0,028	1,3	1,1 – 1,7
Tattoo behavior			
Never have	*reff*		
Have	0,201	1,2	0,9 – 1,4

DISCUSSION

STI is a disease that can be transmitted through sexual intercourse, whether vaginal or anal intercourse. STI is the entry point for HIV in both heterosexual groups and homosexual groups, namely MSM and gays (Australian Government et al., 2017; Chigorimbo-Murefu et al., 2022; Ditjen P3 Kemenkes, 2022). STI itself, once present in the human body, is usually characterized by pus coming out of the genitals, lumps

on the genitals, and wounds around the genitals (Australian Government et al., 2017; KPA et al., 2012). This research found that almost all MSM have one of the 8 symptoms of STIs that are transmitted through sexual behavior. These results are consistent with previous research, namely: in America, young MSM and transgender women who have sexual activity more than once a week are at 1.13 times greater risk of experiencing gonorrhea (Janulis et al., 2023). Research conducted in South Africa reported that the proportion of MSM who had one of the symptoms of an STI was around 28.1%, this is because apart from not consistently using condoms, the number of sexual partners in a week also influences (Le Roux et al., 2022)

Cases of chlamydia and gonorrhea in Indonesia in key populations have also increased by 30 times compared to the general population, this is due to inconsistencies in using condoms and also limited access to condoms in key population groups (Ditjen P2PM, 2022; Fatiah, 2023; Fatiah & Tambing, 2023). For this reason, preventive behavior is needed in the form of circumcision behavior.

Circumcision or circumcision aimed at men has many benefits, in the form of preventing transmission of STIs and HIV through sexual intercourse (Spriritia, 2021; WHO, 2022c). His happens because the inner foreskin, penile shaft, and urethral introitus are potential entry points for HIV and STIs (Anderson et al., 2011; Spriritia, 2021). Simply put, the outer skin of the penis or foreskin of an uncircumcised penis has folded, and the inner foreskin during sexual intercourse will experience a lot of friction during anal intercourse so that the mucosal epithelium will quickly fall off and become a gathering place for micro biochemistry which is the target of HIV (Nshimirimana et al., 2022; Sharma et al., 2018). The inner foreskin of the penis that is injured or lesioned will be more easily penetrated by HIV and microbes that can cause STIs, especially when men infected with HIV/STIs release seminal fluid containing HIV/STIs and then enter the inner foreskin of the penis with the lesion (Anderson et al., 2011; Asa et al., 2023; KPA et al., 2012).

This research found a link between circumcision behavior in efforts to prevent the spread of STIs in this study, which is consistent with the theory that has been expressed and several previous studies, namely: circumcision behavior in heterosexual and homosexual groups prevents around 0.58 times greater than HIV and STI which are transmitted through sexual relations (Sharma et al., 2018). In South Africa, circumcision behavior can protect around 21.1% of Herpes Simplex Virus (HSV-2), and 31% prevent the occurrence of HIV and Hepatitis B in housewives compared to men (Amusa et al., 2021; Davis et al., 2019).

There is no standard policy regarding the obligation to carry out circumcision procedures for men in Indonesia, it is only limited to the form attached to one of the efforts to prevent HIV and STIs through circumcision behavior, this can be seen in several policies that have been issued but have been revoked and do not apply as per the Ministerial Regulation Health No. 12 of 2013 concerning HIV and AIDS Management, then there is East Java Governor Regulation No. 35 of 2020, all of which only mentions additional efforts to prevent HIV transmission through circumcision, without any further intervention.

Prevention of transmission of STIs and HIV does not just depend on circumcision behavior but needs to be supplemented with consistent behavior of using condoms during sex and correct use of condoms, unfortunately, the availability of condoms in some localization places where MSM work is very minimal and there are rarely even condoms available in localizations so there are no It is believed that the increase in STI and HIV is high among MSM considering that the number of customers served in a week is around 2 people per week (Fatiah, 2023; Fatiah & Tambing, 2023).

Limiting the number of sex clients in one week, being faithful to your partner not having sex before marriage, and increasing knowledge about the dangers of STI and HIV in key populations is one of the keys to efforts to prevent HIV transmission in key populations which will later have an impact on the general population (Purnamawati et al., 2022; Sabilla & Nurfadhilah, 2022).

This research has several limitations, including in terms of the research design used, it is cross-sectional which does not look at the effects of an exposure being studied simultaneously, another limitation is in terms of data collection, which we know that the population in this study falls into the category hidden population whose sampling is slightly different, where the sampling in this study uses the RDS technique, where the technique is similar to the snowball sampling data collection technique, so data processing using the RDS technique should use the RDSA data collection technique to avoid bias in processing research data. Other limitations include limitations in the variables to be analyzed, where not all variables to be studied are available in secondary raw data, such as oral sex variables which can also influence the incidence of STIs among MSM.

CONCLUSIONS

MSM who have been circumcised are 2.8 times more likely to not have STI symptoms compared to MSM who have not been circumcised after controlling for confounding variables in the form of buying sex behavior and sex selling behavior with men. This research suggests the need for special regulations governing circumcision behavior in men taking into account the need to look at it from a religious and cultural perspective, considering the benefits that circumcision behavior can provide for men. As we know, men are one of the groups with the highest proportion of male circumcision behavior. The largest person in Indonesia who transmits STI to his partner.

ACKNOWLEDGEMENT

The author would like to thank Lembaga Penelitian Pengabdian Masyarakat (LPPM) Universitas Cenderawaih (FKM) for facilitating the author and also the HIV, AIDS, and STI Sub-Directorate of the Ministry of Health for this research.

REFERENCES

Afshar, K., Kazemi, B., & MacNeily, A. E. (2018). The Role of Circumcision in Preventing Sexually Transmitted Infections. In *Diagnostics to Pathogenomics of Sexually Transmitted Infections*. https://doi.org/10.1002/9781119380924

Amusa, L., Zewotir, T., North, D., Kharsany, A. B. M., & Lewis, L. (2021). Association of Medical Male Circumcision and Sexually Transmitted Infections in a Population-Based Study using Targeted Maximum Likelihood Estimation. *BMC Public Health*, *21*(1), 1–10. https://doi.org/10.1186/S12889-021-11705-9/TABLES/3

Anderson, D., Politch, J. A., & Pudney, J. (2011). HIV infection of the penis. *American Journal of Reproductive Immunology (New York, N.Y.: 1989)*, *65*(3). https://doi.org/10.1111/J.1600-0897.2010.00941.X

Asa, G. A., Fauk, N. K., & Ward, P. R. (2023). Traditional male circumcision and the risk for HIV transmission among men: a systematic review. *BMJ Open*, *13*(5), e072118. https://doi.org/10.1136/BMJOPEN-2023-072118

Australian Government, Bappenas, Dinkes Provinsi Papua, Dinkes Provinsi Papua Barat, KOMPAK, & BaKTI. (2017). *Buku Kader Pemberdayaan Kampung Informasi Dasar HIV dan AIDS*. https://batukarinfo.com/system/files/Informasi Dasar HIV %26 AIDS.pdf

CDC. (2022a). *Sexually Transmitted Infections Prevalence, Incidence, and Cost Estimates in the United States*. Division of STD Prevention, National Center for HIV, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention. https://www.cdc.gov/std/statistics/images/FullSTI-Cost-Estimates-8.png

CDC. (2022b). *STD Facts – What Gay, Bisexual and Other Men Who Have Sex with Men Need to Know About Sexually Transmitted Diseases*. CDC. https://www.cdc.gov/std/life-stages-populations/stdfact-msm.htm#print

Chigorimbo-Murefu, N. T. L., Potgieter, M., Dzanibe, S., Gabazana, Z., Buri, G., Chawla, A., Nleya, B., Olivier, A. J., Harryparsad, R., Calder, B., Garnett, S., Maziya, L., Lewis, D. A., Jaspan, H., Wilson, D., Passmore, J. A. S., Mulder, N., Blackburn, J., Bekker, L. G., & Gray, C. M. (2022). A Pilot Study to Show that Asymptomatic Sexually Transmitted Infections alter the Foreskin Epithelial Proteome. *Frontiers in Microbiology*, *13*, 3536. https://doi.org/10.3389/FMICB.2022.928317/BIBTEX

Davis, S., Toledo, C., Lewis, L., Maughan-Brown, B., Ayalew, K., & Kharsany, A. B. M. (2019). Does Voluntary Medical Male Circumcision Protect against Sexually Transmitted Infections among Men and Women in Real-world Ccale-up Settings? Findings of a household survey in KwaZulu-Natal, South Africa. *BMJ Global Health*, *4*(3), e001389. https://doi.org/10.1136/BMJGH-2019-001389

Ditjen P2PM. (2022). Laporan Kinerja 2022 Direktorat Pencegahan dan Pengendalian Penyakit Menular. Jakarta: Kementerian Kesehatan R.I. Retreived from https://p2pm.kemkes.go.id/storage/informasi-publik/content/GHwE3BiLbOrvZZPKY1Pm91BIRWqzE4-metaTGFwa2luIFAyUE0gMjAyMi5wZGY=-.pdf

Ditjen P3 Kemenkes. (2022). Laporan Ekslusif Perkembangan HIV AIDS dan PIMS triwulan III Tahun 2022. Jakarta: Kementerian Kesehatan R.I. Retreived from https://siha.kemkes.go.id/portal/files_upload/Laporan_TW_3_2022.pdf

Fatiah, M. S. (2023). Determinan Akses Memperoleh Kondom pada Lelaki Seks Lelaki (LSL) di Indoneisa. *Jurnal Kesehatan Reproduksi*, *14*(1). https://doi.org/10.58185/JKR.V13I1.22

Fatiah, M. S., & Tambing, Y. (2023). Pengaruh Akses Ketersediaan Kondom terhadap Perilaku Unsafe Sex pada Lelaki Seks Lelaki (LSL) di Indonesia. *Jurnal Ilmu Kesehatan Masyarakat*, *12*(6). https://journals.stikim.ac.id/index.php/jikm/article/view/2321

Ganeswari, putu ayu dewita, Maheswari, luh made shanti, & Puspawati, ni made dwi. (2020). Sirkumsisi dan Perannya dalam Pencegahan IMS. *Intisari Sains Medis*, *11*(3), 1157–1164. https://doi.org/10.15562/ism.v11i3.835

Gao, Y., Yuan, T., Zhan, Y., Qian, H. Z., Sun, Y., Zheng, W., Fu, L., Liang, B., Zhu, Z., Ouyang, L., Liu, M., Fitzpatrick, T., Wu, Z., Meng, X., Baeten, J. M., Zhao, J., Vermund, S. H., Yu, M., Wu, G., … Zou, H. (2021). Association between Medical Male Circumcision and HIV Risk Compensation among Heterosexual Men: A Systematic Review and Meta-Analysis. *The Lancet Global Health*, *9*(7), e932–e941. https://doi.org/10.1016/S2214-109X(21)00102-9

Janulis, P., Goodreau, S. M., Morris, M., Birkett, M., Gregory Phillips, I., Risher, K., Mustanski, B., & Jenness, S. M. (2023). Partnership Types and Coital Frequency as Predictors of Gonorrhea and Chlamydia among Young MSM and Young Transgender Women. *International Journal of STD & AIDS, 34*(10), 694–701. Retreived from https://journals.sagepub.com/doi/abs/10.1177/09564624231173728

Kemenkes. (2016). *Pedoman Nasional Penangganan Infeksi Menular Seksual* . https://siha.kemkes.go.id/portal/files_upload/buku_pedoman_nasional_tatalaksna_ims_2016_ok.pdf

KPA, Burnet Insitute, & Australian AID. (2012). *Modul Kesehatan Seksual Perempuan "Pemenuhan Hak, Kesehatan Seksual dan Reproduksi Perempuan."* Lembaga Penelitian Pendidikan Penerbitan Yogya. https://siha.kemkes.go.id/portal/files_upload/2_1_j__MODUL_KESEHATAN_SEKSUAL_PEREMPUAN__revisi_31_5_2012__copy.pdf

Le Roux, M., Ngwenya, I. K., Nemarude, A. L., De Villiers, B. E., Mathebula, M., & Nchabeleng, M. (2022). Sexually transmitted infections and sexual behaviour among men having sex with men from Tshwane, South Africa, *34*(3), 183–190. https://doi.org/10.1177/09564624221146673

Morris, B. J., Krieger, J. N., & Klausner, J. D. (2017). CDC's Male Circumcision Recommendations Represent a Key Public Health Measure. *Global Health Science and Practice*, *5*(1), 15–27. https://doi.org/10.9745/GHSP-D-16-00390

Nshimirimana, C., Vuylsteke, B., Smekens, T., & Benova, L. (2022). HIV testing uptake and determinants among adolescents and young people in Burundi: a cross-sectional analysis of the Demographic and Health Survey 2016–2017. *BMJ Open*, *12*(10), e064052. https://doi.org/10.1136/BMJOPEN-2022-064052

Peraturan Bupati Tegal tentang Pemberdayaan Masyarakat dalam Upaya Penanggulangan HIV dan AIDs di Tingkat Desa, (2016). https://peraturan.bpk.go.id/Download/244048/16pbkabtegal020.pdf

Purnamawati, D., Nurfadhilah, N., Zam-zam, R., Amalia, K., & Ningsih, R. Z. (2022). Pengalaman Penderita HIV Pada Lelaki Suka Lelaki (LSL); Analisis Kualitatif tentang Persepsi Diri, Respon Saat Didiagnosis, Perilaku Pencegahan, dan Dukungan Pendamping Sebaya. *Jurnal Kedokteran Dan Kesehatan*, *June*, 155–163. Retreived from https://jurnal.umj.ac.id/index.php/JKK/article/view/13062

Sabilla, M., & Nurfadhilah. (2022). Pengetahuan Komprehensif Remaja tentang HIV di Kota Tangerang Selatan menuju End AIDS by 2030. *Jurnal Kesehatan Reproduksi*, *13*(1), 1–23. https://journaliakmitangsel2.iakmi.or.id/index.php/kespro/article/view/22

Sharma, S. C., Raison, N., Khan, S., Shabbir, M., Dasgupta, P., & Ahmed, K. (2018). Male circumcision for the prevention of human immunodeficiency virus (HIV) acquisition: a meta-analysis. *BJU International*, *121*(4), 515–526. https://doi.org/10.1111/BJU.14102

Spriritia. (2021). *Pria yang Tidak Disunat Berisiko Lebih Besar Tularkan HIV - Spirita*. Yayasan Spriritia. https://spiritia.or.id/informasi/detail/362

Subdit HIV dan PMS. (2022a). *Laporan Triwulan 1 Tahun 2022 tentang Perkembangan HIV, AIDS dan PMS*. https://siha.kemkes.go.id/portal/files_upload/Laporan_TW_1_2022.pdf

Subdit HIV dan PMS. (2022b). *Perkembangan HIV AIDS dan Penyakit Infeksi Menular Seksual (PIMS) Triwulan II Tahun 2022*. https://siha.kemkes.go.id/portal/files_upload/Laporan_TW_2_2022.pdf

UNAIDS. (2021). *UNAIDS data 2021*. https://www.unaids.org/sites/default/files/media_asset/JC3032_AIDS_Data_book_2021_En.pdf

UNHCR, UNICEF, WFP, UNDP, UNFPA, UNODC, ILO, UNESCO, WHO, & World Bank. (2021). Fast-Track Ending the AIDS Epidemic by 2030. In *Nucl. Phys.* https://www.unaids.org/sites/default/files/media_asset/JC2686_WAD2014report_en.pdf

WHO. (2018). Male Circumcision for HIV Prevention: Manual for Male Circumcision Under Local Anaesthesia and HIV Prevention Services for Adolescent Boys and Men. In *African journal of reproductive health* (Vol. 10). WHO. https://doi.org/10.2307/30032467

WHO. (2021a). Assessment of country implementation of the WHO global health sector strategy for sexually transmitted infections (2016–2021): results of a national survey. In *World Health Organization*. WHO. https://apps.who.int/iris/handle/10665/345086

WHO. (2021b). Global Progress Report on HIV, Viral Hepatitis and Sexually Transmitted Infections, 2021. In *WHO* (Vol. 53, Issue 9). https://www.who.int/publications/i/item/9789240027077

WHO. (2022a). *2022 – 2030 Action Plans for ending HIV , viral hepatitis and STIs in the WHO European Region Draft for consultation*. WHO. https://www.euro.who.int/__data/assets/pdf_file/0007/524059/HIV-Hepatitis-STIs-actions-plans-consult-eng.pdf

WHO. (2022b). *Global Health Cector Strategies on, Respectively, HIV, Viral Hepatitis and Sexually Transmitted Infections for the Period 2022-2030*. WHO. https://www.who.int/publications-detail-redirect/9789240053779

WHO. (2022c). *Sexually Transmitted Infections*. WHO. https://www.who.int/southeastasia/health-topics/sexually-transmitted-infections
WHO. (2022d). *Sexually Transmitted Infections (STIs)*. WHO. https://doi.org/10.1201/9781003039235-48