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Sinta 3 - Social Environment of Friends, Family, Communities, and HIV AIDS Cases .pdf

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CHARACTER COUNT

28867 Characters

PAGE COUNT

9 Pages

FILE SIZE

431.9KB

SUBMISSION DATE

Mar 31, 2023 1:27 PM GMT+7

REPORT DATE

Mar 31, 2023 1:28 PM GMT+7

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Social Environment of Friends, Family, Communities, and HIV/AIDS Cases

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DATA OF ARTICLE:

Received: 07 Aug 2021

Reviewed: 03 Nov 2021

Revised: 13 Dec 2021

Accepted: 04 Jan 2022

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DOI:

10.18196/mmjkk.v21i2.12505

TYPE OF ARTICLE:

Research

Abstract: Control of HIV/AIDS infection can be done by screening at-risk groups in the social environment to prevent transmission. This study aims to determine the social environment of friends, family, and society's influence on HIV/AIDS incidence. The study was conducted in December 2020–January 2021 at six Bandar Lampung health centers. The 111 respondents were divided into case/reactive and control/non-reactive groups, with a 1:2 ratio (37:74). Data were obtained by interview. The independent variables were the social environment of friends, family, and community, while the dependent variable was HIV/AIDS incidence. The data were analyzed bivariate and multivariate with the Binary Logistics Regression test utilizing Minitab 16 application, with CI 90% and α 0.1 significance level. The results showed that friends with HIV's social environment had p 0.087; friend's education p 0.542; risky behavior from friends p 0.853; friends with risky behavior p 0,172; HIV family social environment p 0.999; family education p 0.999; risky behavior from family p 0.998; families with risky behavior p 0.999; HIV community social environment p 0.999; public education p 0.330; risk behavior from the community p 0.690; community with risky behavior p 0.862. Thus, only friends with HIV's social environment affected HIV/AIDS incidence. Furthermore, having friends with HIV's social environment will increase the risk of getting HIV/AIDS.

Keywords: Social Environment; Friends; HIV/AIDS; Risk Factor

INTRODUCTION

To reduce HIV AIDS cases in Indonesia in 2030, The Ministry of Health has arranged the National Action Planning to prevent and control HIV AIDS in 2020-2024 as a reference to act. One of the goals is the achievement of Three Zero. Three Zero is the condition where there are zero new HIV infections, zero death due to AIDS, and zero stigma and discrimination due to HIV AIDS.¹ Based on the estimated calculation from 2020, there would be 543,100 people infected by HIV/AIDS. The HIV/AIDS Information System (SIHA) reported in December 2019 showed that HIV infected 377,564 people. Indonesia was placed at fourth-biggest population worldwide, consisting of 17,000 islands. The decentralized government system had been applied in 514 regencies/cities, which spread in 34 provinces. It challenged the government to control HIV AIDS from geographical and socio-economic aspects. The government's success in controlling HIV and AIDS in all regions in Indonesia had a positive impact globally.¹

Based on the report from Prevention and Controlling on Public Health Service Division in Bandar Lampung City, there was an escalation amount of HIV-AIDS, in 2015 there were 255 cases, in 2016 there were 324 cases, in 2017 there were 321 cases, and in 2018 there were 340 cases of HIV-AIDS that had been found. In 2015 – 2019, there were 1,480 cases of HIV-AIDS in Bandar Lampung that had been detected. However, these numbers were only the detected numbers reported to Public Health Service in Bandar Lampung. Meanwhile, many cases had not been reported yet for some reason. According to WHO, HIV/AIDS is one of

the deadly diseases. Based on data from United Nations Program on HIV and AIDS (UNAIDS), there were 1.1 million people all over the world had died due to AIDS, and also about 35 million people had died since HIV/AIDS pandemic had been found from the first time until the end of the year 2015.¹

Health degrees are affected by four factors: behavior, environment, health service, and genetics.² Behavior that affected HIV/AIDS were (free sex, homosexuality, drugs), Health Service (pre and post counseling test), and social environment (friends, family, and society).^{3,4} Thus, HIV/AIDS was not a disease caused by genetic factors. There needs to have a social culture to prevent the transmission of HIV/AIDS, such as gender equality and specific regulation for women.⁵ The social environment was the place where daily activities happened. The social environment was the defining factor of behavior's changing in groups or individuals. Family, friends and living environments create an individual's behaviors.^{3,4} Good social environment creates good behavior as an individual's behavior and personality were created from their living social environment.^{6,7}

There was a relationship between social environment and HIV/AIDS cases.⁶ Risk friends caused 96.4% of HIV/AIDS cases while 32.1% were on control. Risk families caused 60.7% of HIV/AIDS cases while 32.1% were on control. Risky regional stakeholders caused 60.7% of HIV/AIDS cases while 39.3% were on control.⁶ Another research in South Africa also explained the risk and perception of peer friends on HIV cases, $P < 0.01$.⁷ Although several previous studies have proven that there is an influence of friends, family, and community to form risky behavior that leads to HIV/AIDS infection, there has not been a comprehensive study of how it relates, especially in Bandar Lampung. Thus, it becomes interesting to identify the effect on the social environment of HIV/AIDS cases in Bandar Lampung. This research hypothesized the social environment's effect of friends, families, and communities on HIV/AIDS cases in Bandar Lampung. This research is expected to be able to give an evaluation on Preventing and Controlling HIV/AIDS Disease Program, to give suggestions to achieve the target of 3 zero (Zero New HIV Infection, Zero AIDS death, Zero Discrimination) in Bandar Lampung, offers information about the role of the social environment of friends, families, and communities towards HIV/AIDS cases, and become a consideration for the following researchers or a public reference regarding the health and environment field.

MATERIALS AND METHOD

Respondent's Characteristic and Research Design

The design of this research is *Case Control*, indicating that there were two groups; case group (positive/reactive HIV/AIDS) and control group (negative/non-reactive HIV/AIDS). Six Public Health Centers of Care and Support & Treatment (*Puskesmas PDP*) were the research setting. These Public Health Centers could examine HIV and prescribe medicine (Simpur, Kedaton, Pasar Ambon, Sukabumi, Gedong Air, and Sukaraja Public Health Centers). This research was conducted from January 2021 to February 2021. This research's respondents were the only respondents examined on HIV/AIDS at those six Public Health Centers, with positive/reactive results or negative/non-reactive results.

Research Variables

Variables in this research were independent variables and dependent variables. The dependent variable on this research included HIV/AIDS cases (reactive and non-reactive). In contrast, independent variables were social environment, which was measured from friends with HIV (yes or no), HIV education from friends (yes or no), friends with risky behavior (yes or no), the effect of risky behavior from friends (yes or no), the social environment of families with HIV (yes or no), HIV education from families (yes or no), families with risky behavior (yes or no), the effect of risky behavior from families (yes or no), the social environment of communities/neighbors with HIV (yes or no), HIV education from communities/neighbors (yes or no), communities/ neighbors with risky behavior (yes or no), and the effect of risky behavior from communities/ neighbors (yes or no).

Population, Sample, and Sampling

The population in this study were all clients who were tested for HIV/AIDS at 6 CST Service Health Centers as many as 5,024 people, including MSM, female sex workers, transsexuals, pregnant women, and clients with other criteria than those whom health providers initiated either volunteer or to do HIV/AIDS testing. The samples were clients who were checked for HIV/AIDS with reactive and non-reactive results. Based on the calculation result, the required minimum number of respondents was 33.⁸ However, the researchers added 10% of respondents, and the total was 37 respondents. The amount of each sample was divided into two groups, case group with reactive result and control group (non-reactive result with risky

behavior and non-reactive result without risky behavior) with a ratio of 1:2. Thus, the total of the determined sample was 37:74 or 111 sample.⁹

The sampling procedure started by determining the setting for sampling, which was only at 6 Public Health Centers with The Care, Support, and Treatment (CST) services. The six Public Health Centers with CST were Pasar Ambon, Sukaraja, Sukabumi, Gedong Air, Simpur, and Kedaton. The sampling technique in this study was purposive sampling. Sampling was taken only to respondents who had been examined on HIV/AIDS at those six Public Health Centers with positive/reactive results or negative/non-reactive results. The respondent participated in this research voluntarily and obtained information before the interview. The researchers gave souvenirs to respondents as a sign of appreciation. The *Ethical clearance* of this research was obtained from the Ethical Commission of Medical and Health Research, Medical Faculty, Lampung University. The data were collected using questionnaires with only an initial name to protect respondents' data/sampling privacy.

Collecting Data Technique, Strength and Accuracy

The instruments used in collecting the data were questionnaires and interviews. The researchers arranged the questionnaire using the research variable as the reference. Equipment used in this research included a questionnaire, stationery, handphone, and laptop with *Minitab 16 software* to analyze variables on this research. The researchers used interviews and questionnaires to collect the data. The instrument of the questionnaire had passed the validity and reliability test. The researchers utilized the *Product Moment Coefficient of Correlation* to test the validity, and the result was all value r_{count} (*Corrected item-total correlation*) $> r_{table} = 0.2732$. It is showed that all question items were valid. The researchers used the Alpha formula to test reliability, and the result showed Cronbach's Alpha of 0.747 or bigger than $\alpha = 0.600$. It is shown that the instrument was reliable and could collect the data.

Data Analysis

The researchers used univariate analysis to analyze the data, indicating that the researchers should explain and describe the characteristics of each variable in this research. Each data category was analyzed to identify the distribution of frequency and percentage. The percentage and variable research scores were presented using qualitative criteria.¹⁰ Bivariate analysis was carried out to preview the relationship between dependent and independent variables statistically and logistic regression multivariate analysis to identify how big the impact of the independent variable on HIV/AIDS cases was with *software Minitab 16* on computer.

RESULTS

The socio-demographic characteristics of the respondents in this study were respondents who had tested HIV/AIDS with reactive/positive results (cases). They were dominated by women, and the marital status was dominated by single, either unmarried or widowed. The latest education level was dominated by high school level, and they mostly worked as private workers. Meanwhile, respondents who had tested for HIV/AIDS with non-reactive/negative results (controls) were dominated by men. The marital status was dominated by married respondents. The education level was dominated by high school level, and mostly they worked as private workers (Table 1).

Table 1. Distribution of Social Demographic Frequency on HIV/AIDS Screening in Bandar Lampung City

Variable	Case		Control	
	n	%	n	%
Socio-Demographic				
Gender				
Male	10	27	43	52
Female	27	73	31	42
Marital Status				
Married	14	38	39	53
Unmarried/widowed	23	62	35	47
Education level				
Junior High School	6	16	19	26
Senior High School	22	60	36	48
College	9	24	19	26
Job				
Government employees	3	8	12	16
Private employees	26	70	35	47
Laborer	1	3	5	7
Unemployed	7	19	22	30

In this research, based on the findings from univariate variable analysis on the social environment of friends, the respondents who had examined on HIV/AIDS with reactive/positive results (case group) had more friends with reactive/positive HIV but did not get educated about HIV from friends. They had friends with risky behavior and approached risky behavior influence from friends. Their families also had non-reactive/negative HIV and were not educated about HIV from families. They also did not have a family with risky behavior and never got exposed to their influence from families. Neighbors/communities with non-reactive/negative HIV were not educated about HIV from neighbors/communities. Meanwhile, they had neighbors/communities with risky behaviors and were affected by them.

Meanwhile, the respondents who had examined HIV/AIDS with non-reactive/negative (control group) had more friends with non-reactive/negative HIV but did not get educated about HIV from friends. They also did not have friends with risky behavior and never got influenced by friends. With families with non-reactive/negative HIV, the respondents were never exposed to education about HIV from families. Without having families with risky behavior, they also never got risky behavior influence from families. Besides, from 100% of neighbors with non-reactive/negative HIV, the respondents did not get educated about HIV from neighbors. Meanwhile, without neighbors with risky behavior, they also never got risky behavior influence from neighbors (Table 2).

Table 2. Frequency Distribution of Behavior of FSW, MSM, Transgender, IDU, Sex Worker Customers, Duration of Behavior During HIV/AIDS Examination in Bandar Lampung City

Variable	Case		Control	
	n	%	N	%
Social Environment of Friends				
Friends with HIV				
HIV (+)	21	57	15	20
HIV (-)	16	43	59	80
Education from Friend				
Yes	13	35	12	16
No	24	65	62	84
Friend with Risky Behavior				
Yes	29	78	34	46
No	8	22	40	54
Risky Behavior Influence from friend				
Yes	25	68	22	30
No	12	32	52	70
Social Environment of Family				
Family with HIV				
HIV (+)	3	8	3	4
HIV (-)	34	92	71	96
Education from Family				
Yes	5	14	0	0
No	32	86	74	100
Family with Risky Behavior				
Yes	4	11	0	0
No	33	89	74	100
Risky Behavior Influence from family				
Yes	1	3	0	0
No	36	97	74	100
Social Environment of Community				
Community with HIV				
HIV (+)	2	5	0	0
HIV (-)	35	95	74	100
Education from Community				
Yes	2	5	1	1
No	35	95	73	99
Community with Risky Behavior				
Yes	5	14	3	4
No	32	86	71	96
Risky Behavior Influence from community				
Yes	3	8	1	1
No	34	92	73	99

The findings of bivariate analysis can be seen in Table 3. It showed that the indicator of the social environment of HIV friends affects HIV/AIDS cases in Bandar Lampung. The result of this research was *Odds Ratio* 3.50 with $P = 0.087$. This finding showed that if another variable was fixed, the client who had been examined on HIV/AIDS test and whose friends were positive/reactive on HIV had a bigger chance to be infected on HIV/AIDS with the comparison about 3.50 times higher than clients with non-reactive/negative HIV friends. $P = 0.087$ (or 8.7%) showed the effect of escalation.

Variable of HIV education from friends had a value of $p = 0.542$; friends with risky behavior had a value of $p = 0.853$; risky behavior influence from friends had a value of $p = 0.172$; the social environment of families with HIV had a value of $p = 0.999$; HIV education from families had a value of $p = 0.999$; families with risky behavior had a value of $p = 0.998$; risk behavior influence from families had a value of $p = 0.999$; the social environment of community/neighbor with HIV had a value of $p = 0.999$; HIV education from community/neighbor had a value of $p = 0.330$; community/neighbor with risky behavior had a value of $p = 0.690$; risky behavior influence from community/neighbor had a value of $p = 0.862$. All the values did not affect HIV/AIDS in Bandar Lampung. This finding was in line with previous research that showed harmonic and positive social environment of families had relation on decreasing the level of Sexual Transmitted Disease risky behavior.¹¹ This finding also showed that families' harmonic and positive social environment decreased risky behavior case numbers. Another opinion explained that the social environment was the external factor that indirectly affected someone's behavior.¹² The comparison of the risky sexual practices of street teenagers with parent's support (38.1%) is more than teenagers without parent's support (12.3%).¹³ Based on the finding of those research, there was a possibility that the respondents in this research obtained strong support from their family social environment. Thus, they did not get exposed to risky behavior. Another research showed the strong denial from societies and the environment on people infected by HIV/AIDS that made some of them hide their status and live silently.¹⁴ Furthermore, other research supported the findings. It stated that the factor of communities' knowledge on Sexual Transmitted Infection, HIV/AIDS knowledge, and access to information about HIV/AIDS did not affect people in HIV/AIDS.¹⁵ This condition showed that 100% of respondents with non-reactive/negative results did not have neighbors with HIV/AIDS (Table 3).

Table 3. The Influence of Social Environment of Friend, Family, and Community on HIV/AIDS cases in Bandar Lampung City

Variable	Group		p value	90% CI	OR
	Case	Control			
Social Environment					
Social Environment of Friends					
Friends with HIV			0.087	1.05-11.63	3.50
HIV (+)	21(58%)	15(42%)			
HIV (-)	16(21%)	59(79%)			
Education from friends			0.542	0.52-4.09	1.46
Yes	13(52%)	12(48%)			
No	24(28%)	62(72%)			
Friends with risky behavior			0.853	0.34-3.82	1.14
Yes	29(46%)	34(54%)			
No	8(17%)	40(83%)			
Risky Behavior Influence from friends			0.172	0.80-10.63	2.92
Yes					
No	25(53%)	22(47%)			
	12(19%)	52(81%)			
Social Environment of Family					
Family with HIV			0.999	0.00	0.001
HIV (+)	3(50%)	3(50%)			
HIV (-)	34(32%)	71(68%)			
Education from Family			0.999	0.00	0.001
Yes	2(100%)	0(0%)			
No	32(31%)	74(69%)			
Family with risky behavior			0.998	0.00	0.001
Yes	4(100%)	0(0%)			
No	33(31%)	74(69%)			
Risky behavior Influence from family			0.999	0.00	0.001
Yes	1(100%)	0(0%)			
No	36(33%)	74(67%)			
Social Environment of Community					
Community with HIV			0.999	0.00	0.001
HIV (+)	2(100%)	0(0%)			
HIV (-)	35(32%)	74(68%)			
Education from Community			0.330	0.32-86.06	5.25
Yes	2(67%)	1(33%)			
No	35(32%)	73(68%)			
Community with risky behavior			0.690	0.13-27.74	1.91
Yes	5(63%)	3(37%)			
No	32(31%)	71(69%)			
Risky behavior Influence from community			0.862	0.04-55.98	1.47
Yes	3(75%)	1(25%)			
No	34(32%)	73(68%)			

The result of multivariate analysis has been used as a double logistic regression test as the dependent variable was categorical.¹⁶ The result of bivariate selection was two independent variable indicators with $p < 0.25$ value, indicating that the social environment of friends with reactive/positive HIV and risky behavior influence from friends would continue to the multivariate model. Furthermore, the result showed that social environment indicators of HIV friends had OR 2.63 with *P-Value* 0.075, and risky behavior influence from friends had OR 3.02 with *P-Value* 0.039, influencing HIV/AIDS cases (Table 4).

Table 4. Indicator of Logistic Regression Model on Social Environment and HIV/AIDS Cases in Bandar Lampung

Variable	P-Value	90% CI	Odds Ratio
Social environment of HIV friends	0.075*	1.08 - 6.42	2.63
Risky behavior influenced by a friend	0.039*	1.25 - 7.30	3.02

Note: * significant/real effect

DISCUSSION

The analysis results in this research showed that the social environment of friends with positive/reactive HIV (OR 2.63 with *P-Value* 0.075) and risky behavior influence from friends (OR 3.02 with *p* 0.039) had the same effect on HIV/AIDS cases. The findings of this research are in line with the previous research conducted by Handayani in 2018, revealing that there was a relationship between friends' role with HIV/AIDS case, proven by a *p*-value of 0.000.⁵ Another research in South Africa showed the same relationship between networking friendship characteristics on HIV cases and a *p* 0.025 value.¹⁷ Another research in south Africa also explained the risk and perception of peer friends that affect HIV cases with a *p* < 0.01 value.⁶ Peer friends usually had the same age or maturity, and it affected the central factors to shape the teenager's behavior. Peer friends also gave dominant contributions in many aspects and modeled teenagers' sexual behavior with their couple.¹⁸ Another research showed that peer friends were the central factor to shape teenagers' behavior, including pre-marital sexual behavior.¹⁹ One factor affecting other people's behavior was behavior from other "special/important" people; thus, people were referred to as role models. People around an individual could affect other people if that person had a strong impression, such as best friends.²⁰ An individual tends to have the same characteristic and behavior as those "important" people.²⁰ There was a relationship between peer friends' role with HIV/AIDS prevention, proved by a *p*-value of 0.000.²¹ Based on the Product Moment test with a trust level of 95% (α 0.05), the result was *p* 0.000. It showed the relationship between peer friend sexual behavior with teenager sexual behavior. Meanwhile, the *r* 0.448 value showed that the relationship was pretty close. It indicated that the higher the peer friend's risky behavior is, the higher the teenager's risky behavior will be.²² The variable which directly affected the HIV/AIDS preventing behavior on the result of hypothesis test was from the same Sexual Worker Women (WPS) friends' support about 22.9% on Sexual Worker Women (WPS) HIV/AIDS preventing behavior.²³

The result of the research showed that teenagers' behavior variable was directly affected by peer friends about 32.563% in preventing HIV/AIDS. This result presented that peer friends' role influenced teenagers' behaviors due to daily socialization at a school environment with friends.²⁴ Another research also showed peer friends' role on those infected by HIV AIDS (ODHA) stigma with *p* 0.0001 and OR 7.82.²⁵ In other studies, most Sexual Worker Women (WPS) in Padang also had good preventing behavior around 66 % that can be seen from Sexual Worker Women (WPS) friends' great support on preventing behavior in Padang with *p* 0.027.²⁶ Based on *enabling factor*, only peer friends' variable affects HIV/AIDS preventing behavior with *p* 0.024. On multivariate analysis with logistic regression test, peer friend influenced HIV/AIDS prevention with *p* 0.048 and Exp (B) 5.600.²⁷ It is in line with research that stated a relationship between peer friends and sexual behavior with OR 27.34 value, indicating that negative peer friends had a possibility about 27.34 times higher on sexual behavior than positive ones.²⁸ Another test result towards parameter coefficient between peer friend support and behavior showed a direct effect of about 17.1%, while the indirect effects from peer friend's knowledge support were 14.46%. Support from peer friends positively affected HIV/AIDS prevention behavior about 2.18 value with *T* statistic was 2.594 value. *T* statistic value was on 1.96 critical values. The result of the research showed the positive effect of peer friend's support. It indicated that positive support from peer friends influenced HIV/AIDS prevention behavior.²⁹ Another research also showed a relationship between peer friend role on pre-marital sexual behavior proved by *p* 0.004 value.³⁰ Based on the above explanation, HIV/AIDS in Bandar Lampung had a close relationship to the social environment of friends.

To achieve the *Three zero* HIV/AIDS program's goals, the mortality rate of HIV/AIDS should be decreased by abolishing stigma and discrimination on HIV/AIDS and maximizing effort to pay more attention to the social environment of friend's indicators. It met the National Action Planning to Prevent and Control HIV AIDS by The Ministry of Health in 2020-2024. The most influential program's policy was "fast track initiative 90-90-90", where the government step by step decided to achieve the target of 90-90-90, starting from the district level. It is in line with the mandate on Act Number 23 of 2014 about Local Government and Government Regulations Number 2 of 2018 about Minimum Service Standards, revealing that health service is on government's matter which is decentralized and compulsory on District and Local government's basic service (30).³¹ Health service for people with HIV was one of 12 Minimum Service Standards in which the quality and basic service should be fulfilled by district government as the Ministry of Health's Regulation Number 4 of 2019 about Technical Standard of Basic Quality Service Fulfilment on Minimum Service Standards in Health Sector.

The effort to achieve 90-90-90 started from the district using the district-based *intervention*. Each district should implement Preventing and Controlling HIV/AIDS Program and achieve the fixed target. The Minimum Service Standards of Preventing and Controlling HIV/AIDS program in the Public Health Office in Bandar Lampung decided to achieve 100% screening on HIV/AIDS test target of risky groups from the first

1 level of health service facilities, such as public health service and private clinic. To achieve the target, the first level of health service facilities, such as public health services and private clinics, should focus on HIV/AIDS screening tests, such as VCT Mobile Action in friend/community and work environment.³²

CONCLUSION

The social environment of reactive/positive HIV friends and risky behavior increased HIV/AIDS cases in Bandar Lampung. Therefore, the enhancement of HIV/AIDS screening tests in the environment of risky behavior friends has to be optimized to identify the findings of HIV/AIDS cases.

ACKNOWLEDGEMENT

The researchers would like to thank dr. Edwin Rusli, M.KM (Chief of Health Service/DinKes in Bandar Lampung) and dr. Hany Musliha (Chief of Public Health Service Kemiling/where I worked) who have permitted me to study. It also goes to dr. Jhoni Effensyah (Chief of Public Health Sukaraja), dr. Iiskha Sari Sandiaty (Chief of Public Health Simpur), dr. Rini Alita (Chief of Public Health Service Kedaton), drg. Ian Rahmadi (Chief of Public Health Service Sukamaju), dr. Titin Agustin (Chief of Public Health Service Gedong Air), and dr. Desma (Chief of Public Health Service Pasar Ambon) who have given me permission to conduct research and collect data at their place to complete this article. In addition, I also would like to thank the Postgraduate Director of Lampung University (Prof. Dr. Ir. Ahmad Saudi Samosir, S.T., M.T.), who has supported me in completing this research.

CONFLICT OF INTEREST

There is no conflict of interest in this research.

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