

Original Research Article

Knowledge on sexually transmitted infections among HIV-pre-exposure prophylaxis users in Nairobi city county, Kenya

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ABSTRACT

Background: Sexually transmitted infections remain a significant public health problem mainly in low-income countries. Despite the high efficacy of HIV-PrEP, an upsurge of STIs is recorded globally after HIV-PrEP introduction due to sexual behaviour change among the users. Nairobi has the highest rate of HIV-PrEP uptake and large number of HIV-PrEP users visit health facilities to get treatment for STIs. This study aimed to assess knowledge on STIs among HIV-PrEP users in Nairobi, Kenya.

Methods: Analytical cross-sectional research design was employed. Simple random sampling technique was adopted to obtain a sample size of 357 respondents seeking HIV-PrEP service in five health facilities in Nairobi, from July to November 2022. The study used primary data which was collected using structured questionnaire and secondary data (laboratory results).

Results: Most of the respondent were knowledgeable about STIs occurrence. 56.7% of the respondents knew that STIs could be transmitted through sex without using condom, 43.3% knew that sex with sex workers could make one get STIs, 58.7% of the respondents were aware that STIs could be transmitted through sexual contact with multiple partners. A statistically significant association was found between STI related level of knowledge and STIs prevalence among HIV-PrEP users in Nairobi.

Conclusions: The knowledge about STIs among HIV-PrEP users in Nairobi does not translate into safe sexual behaviour against STIs. The study recommends that the facility management and service providers should encourage HIV-PrEP users to undertake routine STIs screening tests and treatment as well as frequent safe sexual behaviour awareness creation education.

Keywords: HIV-PrEP users, Knowledge, Preventive education, STI

INTRODUCTION

STIs are associated with an outcome of morbidity and mortality and remain a significant public health problem mainly in low-income countries including Kenya.¹ STIs are caused by viral, bacterial or parasitic microorganisms that spreads out from one person to another during sexual intercourse.²

Globally, more than a million STIs are acquired daily.³ In 2012, an approximated 357 million new cases of curable STIs occurred amongst 15-49-year-olds globally.⁴ The WHO approximated that yearly in Africa there are 3.5 million cases of syphilis, 15 million situations of chlamydial illness, 16 million cases of gonorrhea, and 30 million situations of trichomoniasis. In Kenya, STIs, in particular adult HIV prevalence is estimated to be 6.2% nationally.⁵ Studies have shown that there is a high

prevalence of gonococcal infection among men who have sex with men (MSM) in Kenya.⁶

In combating HIV/AIDS as one of the STIs, Sustainable Development Goal (SDG) 3, regarding good health and well-being is one of the 17 sustainable development goals established by the United Nations in 2015.⁷ To achieve these goals, various preventive measures have been developed, including of HIV-PrEP as a pre-exposure prophylaxis to prevent HIV infection among those who do not have the disease but are at high risk of getting HIV infection.

The global health sector strategy on STIs has set ambitious targets to eradicate new infections by 2030, namely: a reduction of *T. pallidum* incidence globally by 90%, a decrease of NG occurrence worldwide by 90%, an incidence of 50 or fewer situations of congenital syphilis per 100,000 live births in 80% of nations, nourishment of 90% nationwide coverage as well as at least 80% coverage in every district (or equivalent management system) in countries with the HPV vaccination in their national immunization program.⁸

Similarly, Kenya has set targets to reduce annual new STIs by 75% among adults by 2022. In 2017, the Government of Kenya (GOK) through NASCOP rolled out HIV-PrEP to prevent the spread of HIV/AIDS among the most at-risk groups. The intervention put in place in varied settings including HIV treatment sites, testing/prevention centres, STI clinics, drop-in centres for key populations, and safe spaces for adolescents countrywide. However, the influence of HIV-PrEP on curable STIs among the most at-risk groups has not been elucidated in Nairobi, Kenya. Knowledge of STIs and their complications is important for adequate prevention and treatment, as people who do not know the symptoms may fail to recognize their need and so may not seek help. Yet knowledge of other STIs apart from HIV/AIDS is low in the developing world.⁹ So, the present study was conducted with the aim to assess STI related level knowledge among HIV-PrEP users in Nairobi city county.

METHODS

This study employed an analytical cross-sectional research design. The participants in this study were the clients seeking HIV-PrEP service in five health facilities in Nairobi, Kenya namely; Mbagathi District Hospital, Mama Lucy Level Five Referral Hospital, Lang'ata Health Centre, STC MOH-Casino Heath Centre (Comprehensive Care Centre) and SWOP (Sex Workers Outreach Program) Kenya as shown in Table 1. The units of analysis were the HIV-PrEP users visiting these five selected facilities over a period of 12 months. Purposive sampling was employed to select health facilities offering HIV-PrEP service. Clients seeking HIV-PrEP service were identified from the registration desk at the identified facilities. All available patients meeting the inclusion

criteria were recruited to participate in the study. The five health facilities purposefully selected formed the study strata. Simple random sampling was adopted to select study participants at the respective health facilities, every client who met the inclusion criteria and gave a verbal and written informed consent in their preferred language was recruited until the desired sample size per facility was achieved. The study was conducted from July to November 2022, with data collected from a total of 357 HIV-PrEP users attending the study places. Structured questionnaire was employed in this study for the purposes of collecting primary data from the respondents. The researcher also obtained laboratory test results (secondary data) of the respondents that had been attending the facilities over a period of 12 months. In addition, all the respondents whose secondary data were not available, were tested for STIs using specific tests during the study.

Table 1: Sampling frame and sample size.

Facility	Sampling frame	sample size
Mbagathi district hospital	1,183	128
Mama Lucy level five referral hospital	263	28
Lang'ata health centre	258	27
STC MOH-casino heath centre (comprehensive care centre)	200	21
SWOP (sex workers outreach program) Kenya	1,426	153
Total	3,330	357

Statistical analysis

All collected data was analysed using statistical package for social sciences (SPSS) software V. 26.0. Analysed data was presented as figures and tables in the results section. Pearson's chi-square test was conducted where necessary for observation of significance, and a p value of ≤ 0.05 (5% level of significance) was considered to be statistically significant.

RESULTS

A total of 393 (357 respondents and 10% of 357 which translates into 36) questionnaires were administered to the sampled respondent, out of which 351 of the questionnaires were dully filled and returned translating into a response rate of 89.3% which was considered to be adequate. The socio-demographic characteristics of 351 participants are shown in the Table 2. Majority (58.4%) of the study participants were male, while 41.6% were female. Regarding age, 11.1% were aged between 18-24 years, 39% of the study participants were aged between 25-34 years, 25.1% were aged between 35-44 years, 17.9% were aged between 45-54 years and 6.8% of the study participants were aged 55 years and above. For education, 43.6% of the respondents were holders of

bachelor's degrees, 37.3% were diploma holders, 18.2% studied up to secondary level, while 0.9% were primary school learners. Regarding the duration the respondents have been using HIV-PrEP, the study revealed that 49.3% have been using HIV-PrEP for a period of more than 5 years, 25.9% for a period of between 4-5 years, 16.8% for a period of between 1-3 years, while 8% for just less than 1 year. The majority of the respondents 37.9% were single, 31.3% were either divorced or separated, 20.8% widowed, while 10% either married or cohabiting. Among the respondents, 53% were self-employed, 27.6% were employed, while 19.4% were unemployed.

Table 2: Socio-demographic characteristics of the study respondents.

Variable	Response	Frequency (n=351)	%
Gender	Male	205	58.4
	Female	146	41.6
Age (years)	18-24	39	11.1
	25-34	137	39
	35-44	88	25.1
	45-54	63	17.9
	55 and above	24	6.8
	Primary	3	0.9
Level of education	Secondary	64	18.2
	Diploma	131	37.3
	Degree	153	43.6
Duration of using HIV-PrEP	Less than 1 year	28	8
	1-3 years	59	16.8
	4-5 years	91	25.9
	More than 5 years	173	49.3
Marital status	Single	133	37.9
	Married/cohabitating	35	10
	Divorced/separated	110	31.3
	Widowed	73	20.8
Occupation	Employed	97	27.6
	Self-employed	186	53
	Unemployed	68	19.4

Combined prevalence of STIs among HIV-PrEP users

The results revealed that the combined STIs prevalence among HIV-PrEP users in Nairobi city county was 45.8% (161/351). 54.2% of the patients tested negative of all the curable STIs tested (Figure 1).

Prevalence of specific STIs among HIV-PrEP users

Table 3 shows the prevalence of individual STIs tested. STIs prevalence among this group was; 13.4% for gonorrhea, 9.7% for chlamydia, 7.4% for syphilis, 6.0% for trichomoniasis, 5.1% for herpes (genital herpes), 3.7% for HIV and 0.5% for genital warts.

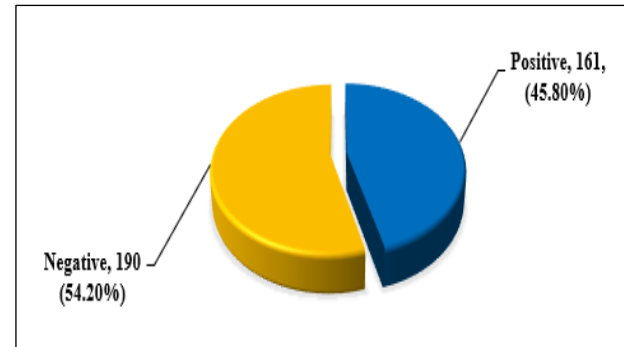


Figure 1: Combined prevalence of STIs among HIV-PrEP users.

Table 3: Prevalence of specific STIs among HIV-PrEP users.

STI Tested	Frequency (n=161)	Percentage
Gonorrhea	47	13.4
Chlamydia	34	9.7
Syphilis	26	7.4
Trichomoniasis	21	6.0
Genital herpes	18	5.1
HIV	13	3.7
Genital warts	2	0.5
Total	161	45.8

STIs related level of knowledge

The study sought to assess the respondents' STIs related level of knowledge and the results were presented in Table 4. Regarding knowledge of transmission of STIs, 76.4% of the respondents had heard about STIs; 56.7% of the respondents knew that STIs could be transmitted through sex without using condom; 43.3% knew that sex with sex workers whether male or female could make one get STIs. Further, 58.7% of the respondents were aware that STIs could be transmitted through sexual contact with multiple partners; while 53.3% of respondents knew receiving infected blood could be a channel of STIs. For knowledge of prevention of STIs, majority (59.5%) of the respondents were aware that the use of condom during sexual intercourse could prevent one from getting STIs; 59.8% were aware that STIs could be prevented by avoiding sexual contact with sex workers whether male or female. Similarly, majority of the respondents (54.1%) were aware that avoiding sexual contact with multiple partners was a prevention measure of STIs. Most of the respondents (58.7%) were found to be aware of the fact that avoiding unscreened blood was a prevention measure of STIs.

Symptoms of STIs experienced by HIV-PrEP users

The study sought to establish the types of symptoms of STIs experienced by HIV-PrEP users in Nairobi and their

responses were as shown in Table 5. The study results revealed that 60.7% of the respondents had not experienced urethral discharge during the past 12 months while 31.3% had experienced; 63.5% had not experienced any abnormal vaginal discharge with strong odour during the past 12 months while 27.4% had experienced abnormal vaginal with strong odour during the past 12 months. Regarding genital ulcers, the study established that 65.0% had not experienced genital ulcer or sore during the past 12 months while 23.4% had experienced. Majority (56.4%) of the respondents had not experienced

genital itching during the previous 12 months while only 31.1% had experienced; 72.6% also indicated that they had not experienced any pain during urination in the past 12 months but 21.4% had experienced. Similarly, majority (65.8%) of the respondents did not experience any swelling around the genital during the past 12 months. Finally, 50.7% of the respondents indicated that they had not experienced frequent urination during the past 12 months while 38.2 had experienced frequent urination during the past 12 months.

Table 4: STIs related level of knowledge of the respondents.

Knowledge		Response	Frequency (n=351)	Percentage
Awareness	Have you ever heard about STIs	No	48	13.7
		Yes	268	76.4
		I don't know	35	9.9
Knowledge of transmission	Sex without condom	No	99	28.2
		Yes	199	56.7
		I don't know	53	15.10
	Sex with sex workers (M or F)	No	119	33.9
		Yes	159	43.3
		I don't know	73	20.8
	Sex with multiple partners	No	106	30.2
		Yes	206	58.7
		I don't know	39	11.1
	Receiving infected blood	No	104	29.6
		Yes	187	53.3
		I don't know	60	17.1
Knowledge of prevention	Use of condom	No	88	25.1
		Yes	209	59.5
		I don't know	54	15.4
	Avoid sex with sex workers (M or F)	No	101	28.8
		Yes	210	59.8
		I don't know	40	11.4
	Avoid sex with multiple partners	No	83	23.6
		Yes	190	54.1
		I don't know	78	22.2
	Avoid unscreened blood	No	92	26.2
		Yes	206	58.7
		I don't know	53	15.1

Table 5: Symptoms of STIs experienced by HIV-PrEP users.

Variable	Response	Frequency (n=351)	Percentage
Urethral discharge during the past 12 months	Yes	110	31.3
	No	213	60.7
	I don't know	28	8.0
Abnormal vaginal discharge with strong odour during the past 12 months	Yes	96	27.4
	No	223	63.5
	I don't know	32	9.1
Genital ulcer or sore during the past 12 months	Yes	82	23.4
	No	228	65.0
	I don't know	41	11.6
Genital itching during the past 12 months	Yes	109	31.1
	No	198	56.4

Continued.

Variable	Response	Frequency (n=351)	Percentage
Pain during urination during the past 12 months	I don't know	44	12.5
	Yes	75	21.4
	No	255	72.6
	I don't know	21	6.0
Swelling around the genital during the past 12 months	Yes	69	19.7
	No	231	65.8
	I don't know	51	14.5
Frequent urination during the past 12 months	Yes	134	38.2
	No	178	50.7
	I don't know	39	11.1

Bivariate analysis

Table 6 shows a statistically significant association between knowledge of transmission regarding having sex with sex workers (M or F) and STIs prevalence ($p=0.038$). Statistically significant associations were also found between knowledge of transmission regarding

receiving infected blood and STIs prevalence ($p=0.002$); between knowledge of prevention regarding the use of condom and STIs prevalence ($p=0.000$); between knowledge of prevention regarding avoiding sex with multiple partners and STIs prevalence ($p=0.007$); between knowledge of prevention regarding avoiding unscreened blood and STIs prevalence ($p=0.012$).

Table 6: Association between STIs related level of knowledge and STIs prevalence.

Knowledge		Response	STIs prevalence			Cross tabs
			Positive	Negative	Total	
Awareness	Have you ever heard about STI	No	38 (79.2)	10 (20.8)	48	$\chi^2=17.400$ df=2 p-value=0.121
		Yes	102 (38.1)	166 (61.9)	268	
		I don't know	21 (60.0)	14 (40.0)	35	
Knowledge of transmission	Sex without condom	No	61 (61.6)	38 (38.4)	99	$\chi^2=0.951$ df=2 p-value=1.301
		Yes	62 (31.2)	137 (68.8)	199	
		I don't know	38 (71.7)	15 (28.3)	53	
	Sex with sex workers (M or F)	No	23 (19.3)	96 (80.7)	119	$\chi^2=27.012$ df=2 p-value=0.038
		Yes	97 (61.0)	62 (39.0)	159	
		I don't know	41 (56.2)	32 (43.8)	73	
	Sex with multiple partners	No	31 (29.2)	75 (70.8)	106	$\chi^2=1.104$ df=2 p-value=0.076
		Yes	111 (53.9)	95 (46.1)	206	
		I don't know	19 (48.7)	29 (51.3)	39	
	Receiving infected blood	No	39 (37.5)	65 (62.5)	104	$\chi^2=29.452$ df=2 p-value=0.002
		Yes	94 (50.3)	93 (49.7)	187	
		I don't know	28 (46.7)	32 (53.3)	60	
Knowledge of prevention	Use of condom	No	50 (56.8)	38 (43.2)	88	$\chi^2=41.231$ df=2 p-value=0.000
		Yes	83 (39.7)	126 (60.3)	209	
		I don't know	28 (51.9)	26 (48.1)	54	
	Avoid sex with sex workers (M or F)	No	56 (55.4)	45 (44.6)	101	$\chi^2=0.129$ df=2 p-value=2.623
		Yes	80 (38.1)	130 (61.9)	210	
		I don't know	25 (62.5)	15 (37.5)	40	
	Avoid sex with multiple partners	No	57 (68.7)	26 (31.3)	83	$\chi^2=38.010$ df=2 p-value=0.007
		Yes	59 (31.1)	131 (68.9)	190	
		I don't know	45 (57.7)	33 (42.3)	78	
	Avoid unscreened blood	No	51 (55.4)	41 (44.6)	92	$\chi^2=29.110$ df=2 p-value=0.012
		Yes	77 (37.4)	129 (62.6)	206	
		I don't know	33 (62.3)	20 (37.7)	53	

Table 7 shows a statistically significant association between experiencing abnormal vaginal discharge with strong odour during the past 12 months and STIs prevalence ($p=0.004$). Statistically significant associations were observed between experiencing genital

itching during the past 12 months and STIs prevalence ($p=0.012$); between experiencing pain during urination during the past 12 months and STIs prevalence ($p=0.009$); also, between experience of frequent urination during the past 12 months and STIs prevalence ($p=0.000$).

Table 7: Association between symptoms of STIs experienced and STIs prevalence.

Variable	Response	STI's prevalence			Cross tabs
		Positive	Negative	Total	
Urethral discharge during the past 12 months	Yes	60 (54.5)	50 (45.5)	110	$\chi^2=2.183$ Df=2 P-value=0.082
	No	86 (40.4)	127 (59.6)	213	
	I don't know	15 (53.6)	13 (46.4)	28	
Abnormal vaginal discharge with strong odour during the past 12 months	Yes	49 (51.0)	47 (49.0)	96	$\chi^2=22.303$ Df=2 P-value=0.004
	No	94 (42.2)	129 (57.8)	223	
	I don't know	18 (56.3)	14 (43.7)	32	
Genital ulcer or sore during the past 12 months	Yes	55 (67.1)	27 (32.9)	82	$\chi^2=0.087$ Df=2 P-value=0.836
	No	80 (35.1)	148 (64.9)	228	
	I don't know	26 (63.4)	15 (36.6)	41	
Genital itching during the past 12 months	Yes	70 (64.2)	39 (35.8)	109	$\chi^2=15.935$ Df=2 P-value=0.012
	No	78 (39.4)	120 (60.6)	198	
	I don't know	13 (29.5)	31 (70.5)	44	
Pain during urination during the past 12 months	Yes	43 (57.3)	32 (42.7)	75	$\chi^2=18.100$ Df=2 P-value=0.009
	No	107 (42.0)	148 (58.0)	255	
	I don't know	11 (52.4)	10 (47.6)	21	
Swelling around the genital during the past 12 months	Yes	38 (55.1)	31 (44.9)	69	$\chi^2=1.902$ Df=2 P-value=0.202
	No	94 (40.7)	137 (59.3)	231	
	I don't know	29 (56.9)	22 (43.1)	51	
Frequent urination during the past 12 months	Yes	77 (57.5)	57 (42.5)	134	$\chi^2=24.021$ Df=2 P-value=0.000
	No	65 (36.5)	113 (63.5)	178	
	I don't know	19 (48.7)	20 (51.3)	39	

DISCUSSION

The present study aimed to assess knowledge on STIs among HIV-PrEP Users in Nairobi City County, Kenya. A total of 351 HIV-PrEP users attending the study places for HIV-PrEP service participated in the study. The baseline sociodemographic characteristics of the participants were recorded, which provided a base-level understanding of the study area's social structure.

This study found out that majority (58.4%) of the study participants were male, compared to 41.6% who were female. This implies that majority of HIV-PrEP users in Nairobi County are male compared to female. This result concurs to a study conducted in United States.¹⁰

However, this result is contrary to the findings of a study conducted in Kenya and Uganda.¹¹

This study found that 39% of the study participants were aged between 25-34 years, while 25.1% were aged between 35-44 years. This implies most of the HIV-PrEP users in Nairobi County are within the age bracket of 25-44 years. A study conducted in New York; USA has a similarity with the result.¹²

Most (43.6%) of the respondents were holders of bachelor's degrees. This implies that most of the HIV-PrEP users in Nairobi County are well educated individuals who understand the importance of using HIV-PrEP to safeguard themselves against contracting HIV/AIDS. This finding is however inconsistent to the

finding of a similar other study done in Kenya and Uganda.¹¹

The findings show that 37.9% of respondents were single, 31.3% were either divorced or separated, 20.8% widowed, while 10% either married or cohabiting. This is a clear indication that most of the HIV- PrEP users in Nairobi City County are single men and women who have no commitment to particular sexual partner and may engage in risky sexual behaviours. This contrasts the findings of another study conducted in Kenya and Uganda.¹¹

On the occupations, majority of the respondents (53%) were self-employed, followed by 27.6% who were employed, while 19.4% were unemployed. The responses show that most of the patients visiting the health facilities has source of income to be able to sustain the use of HIV-PrEP. This is inconsistent to a study conducted in Swaziland.¹³

The findings of this study established that 161 (45.8%) of the HIV-PrEP users had at least one curable STI in the last 12 months. The prevalence of STIs among this groups was; 13.4% for gonorrhea, 9.7% for chlamydia, 7.4% for syphilis, 6.0% for trichomoniasis, 5.1% for herpes (genital herpes), 3.7% for HIV and 0.5% for Genital warts. These results are slightly different from the findings of a study conducted in Nairobi, Kenya.^{14,15} However, the current findings are consistent with a study conducted in Uganda and Western Kenya.^{16,17}

Regarding knowledge of transmission of STIs, the study revealed that 76.4% of the respondents had heard about STIs, 56.7% of the respondents knew that STIs could be transmitted through sex without using condom and 43.3% knew that sex with sex workers whether male or female could make one get STIs. Additionally, 58.7% of the respondents were aware that STIs could be transmitted through sexual contact with multiple partners; and 53.3% of respondents knew that receiving infected blood could be a channel of STIs. The findings of the present study were similar to the findings of other similar studies.^{18,19,20}

The study looked at knowledge of prevention of STIs, the results of the study indicate 59.5% of the respondents were knowledgeable about the use of condom during sexual intercourse could prevent one from getting STIs and 59.8% were aware that STIs could be prevented by avoiding sexual contact with sex workers whether male or female. Similarly, 54.1% were aware that avoiding sexual contact with multiple partners was a prevention measure of STIs. Finally, 58.7% of the respondents were found to be aware of the fact that avoiding unscreened blood was a prevention measure of STIs. These findings are in contrast with a study conducted in Malaysia and in Southwest Ethiopia.^{19,20} However, the findings of the present study concur with a study conducted in Malaysia.¹⁸

On the symptoms of STIs experienced during the past 12 months by HIV-PrEP Users in Nairobi, the findings revealed that 60.7% of the respondents had not experienced urethral discharge; 63.5% had not experienced any abnormal vaginal discharge with strong odour and 65.0% had not experienced genital ulcer or sore. Moreover, 56.4% of the respondents had not experienced genital itching; 72.6% also indicated that they had not experienced any pain during urination. Similarly, 65.8% of the respondents did not experience any swelling around the genital. Finally, 50.7% of the respondents indicated that they had not experienced frequent urination. The findings of the present study were contradictory to the findings of other studies conducted in other countries.^{18,21-26} The findings of the bivariate analysis and binary logistic regression analysis established a statistically significant association between STIs related level of knowledge and STIs prevalence among HIV-PrEP users in Nairobi City County, Kenya.

This study has few limitations. The study was conducted in five health facilities with a small sample size. So, the results may not represent the whole country.

CONCLUSION

This study aimed to assess knowledge on STIs among HIV-PrEP users in Nairobi City County, Kenya. The results of the study reveal that HIV-PrEP users in Nairobi City County are knowledgeable about STIs. However, this does not translate into safe sexual behaviour against STIs. This could explain the high prevalence (45.8%) of STIs among HIV- PrEP users observed in this study.

Recommendations

Based on the data presented, it is recommended that measures be taken to reduce the prevalence STIs resulting from engaging in risky sexual behaviour among HIV-PrEP users. This could involve implementing a continuous comprehensive routine screening tests for STIs in CCC, for prompt identification and treatment of asymptomatic cases; creating awareness about STIs for risky sexual behaviour change; establishing counselling unit within the facilities to provide health information that is basic, accurate in order to promote self-skill and knowledge; providing friendly environmental and non-judgmental services self-skill trainings to change the risky sexual behaviour; undertaking routine STIs screening tests and treatment as well as frequent safe sexual behaviour awareness creation education among HIV-PrEP users. By taking these steps, it is possible to help reduce the prevalence of STIs and create a friendly environment for all.

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