

# Prevalence of Syphilis and HIV Diseases among Some Universities' Students in Mongolia

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**Abstract:** Our country level registered communicable diseases in 2014, 45.6% of them are STD (Sexually Transmitted Diseases). And 43.3% of the affected people by STD are aged between 15-24 years which demonstrated that they have more risky sexual behavior. This study aimed to identify level of prevalence of HIV and Syphilis within university students, to investigate their risky sexual behavior, and to treat them including their sexual partners. The survey included over 1,500 students for screening tests for HIV/Syphilis was performed locally using On Site TM Rapid Test Kits. Through the test not revealed any HIV case, only 40 (2.6%) students diagnosed by syphilis. Screening and confirmation tests for syphilis were performed locally using RPR (Rapid Plasma Reagin) and TPHA (Treponema Palladium Hem agglutination Assay), respectively. The test revealed the diagnosis for first time for 22 (55 %) of those 40 patients with syphilis and 18 (45%) are defined as the control of STD. Therefore, 28 (70%) of them manifested symptoms of STD, only 25 (89.2%) of them previously tested and 9 (32.1%) have not treated at all. The test revealed the diagnosis for first time for 22 (55 %) of those 40 patients with syphilis and 18 (45%) are defined as the control of STD. Finally, above 40 patients are entirely included in treatment with their partners and registered of STD can be controlled.

**Key words:** HIV/AIDS, syphilis infection, student, prevalence.

## 1. Introduction

Sexually transmitted diseases including HIV, Syphilis are still challenging issues not only in Mongolia but also in worldwide and innovation of fight against these diseases released from United Nations and as a global foundation established by donator countries in Mongolia, HIV's incidence restricted.

Worldwide, around 340 million new cases of sexually transmitted diseases were recorded every year, they were 12 million syphilis [1]. Around 15,000

new cases diagnosed and cured in Mongolia, of those 21 percent are syphilis case [2].

Sexually transmitted diseases represent 45.6% of all infectious diseases seen in 2014 and 15-24 ages group represents 43.3% of all patients that show young adults having higher risk to get sick due to their attitude [3]. Therefore, sharing knowledge about prevention of sexually transmitted diseases and implement students to the have a good sexual attitude are beneficial to decrease the incidence.

### 1.1 Purpose

The main goal is to identify HIV and Syphilis prevalence among university students and explore

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sexual attitude to infected patients and supply general knowledge about sexually transmitted diseases and treat them with sexual partner.

### 1.2 Objective

(1) Identified HIV and Syphilis prevalence among university students.

(2) Investigated social and demographic situation among students who has syphilis infection.

## 2. Materials and Methods

### 2.1 Study Design

We have diagnosed HIV and Syphilis by laboratory investigation and data analysis and cross-sectional study methods were combined in this study.

### 2.2 Study's Framework and Method.

All II, III, IV grade students included in the survey were selected in Mongolian state university of education and Mongolian university of life sciences and our study based on Minister of education and sport's appointment number 1A/8585 and Mongolian community of Universities' letter number 1/52 and "Support the student's health campaign" by financial support of World Health Organization and United Nation's Population Fund. In total, 1,500 students were selected with a total of 1,005 were females and 495 were males (Table 1).

The average age was  $21.3 \pm 1.5$ . Student's name and socio-demographic information were concealed. The total of 366 (24.4%) students from Ulaanbaatar and 1,134 (75.6%) students from countryside were enrolled to university. There were 898 (59.87%) single and 353 (23.53%) who live with girlfriends or

boyfriends while 118 (7.87%) are married and 109 (7.27%) people who live with partner. And 758 (50.53%) people live with their parents and others 435 (29.00%) live at dormitory, with relatives. Totally, 179 (11.93%) students do part-time works.

## 3. Methods

The On-Site TM HIV/Syphilis Ab Combo Rapid Test, manufactured by CTK Bio Tech was used in our study.

Venous blood samples (approximately 20  $\mu$ L) were collected by venipuncture using a sterile disposable syringe. Samples contained in a vacuum tube and labeled as rapid test. And 2 drops of sample diluents to the sample and the test result read within 15 minutes.

- The development of C line shows the test is working.
- Presence of HIV line indicates HIV infection.
- Presence of SY line indicates Syphilis infection.

Venous blood samples (approximately 5 mL) were collected from students who have Syphilis infection proven by On-Site TM rapid test. Then screening and confirmation tests for syphilis were performed locally using TPHA (Treponema Palladium Hem Agglutination Assay) performed by manufacturer's standard protocol.

For the sake of reconfirm the result of TPHA, RPR (Rapid Plasma Reagin) test performed on the serum. RPR test performed by manufacturer's protocol (RPR, Teco Diagnostic 1268N. Lakeview Ave. Anaheim, CA92807 USA) and positive samples were tested by quantity method.

Data were analyzed using SPSS 17.

**Table 1** Data collection.

Grade	Mongolian State University of Education		Mongolian University of Life Sciences			All
	N	%	n	%	n	%
II grade	15	2	26	3.467	41	2.73
III grade	235	31.33	470	62.67	705	47
IV grade	500	66.67	254	33.87	754	50.27
All	750	100	750	100	1,500	100

## 4. Results

### 4.1 The Results of Test That Diagnosed Syphilis Infection

When HIV and Syphilis infection test performed among 1,500 University students using On-Site TM Rapid Test, no incidence of HIV infection detected.

Total of 40 (2.6%) students diagnosed by syphilis. Venous blood samples (approximately 5 mL) were collected from students who have Syphilis infection proven by On-Site TM Rapid Test. Then screening and confirmation tests for syphilis were performed locally using RPR and TPHA, respectively (Table 2).

The 40 samples have shown positive result by On-Site TM Rapid Tests that have shown 100% positive result by TPHA test. Despite that by using RPR test, 11 (27.5%) samples including sample number 005, 928, 948, 969, 1017, 1024, 1229, 1249, 1364, 1434, 1259 have shown negative results means and those students had already been infected and treated. (Table 2) We found 22 new incidences of

Syphilis infection by our research. And 7 of total were treating under the control of specialist.

When evaluated syphilis diagnosed 40 students' social and demographic status, 8 males and 32 females were 20-24 years old, total of 26 students were single and 14 who live with girlfriends/wives or boyfriends/husbands or cohabitant (Table 3). As shown on the result of our research, single, female students are more likely to get Syphilis infection compared with single and married male students and the difference is statistically significant ( $p = 0.000$ ,  $p = 0.001$ ). Syphilis infection inclined to increase with student's age.

## 5. Discussions

When HIV and Syphilis infection test performed among 1,500 university students using On-Site TM Rapid Test, no incidence of HIV infection detected. Total of 40 (2.6%) students diagnosed by syphilis. Venous blood samples (approximately 5 mL) were

**Table 2 HIV and Syphilis infection diagnosed.**

№	Code of participants	Age	Name of test			№	Code of participants	Age	Name of test		
			Rapid test	TPHA	RPR				Rapid test	TPHA	RPR
1	005	23	+	+	0	21	950	22	+	+	1:2
2	116*	21	+	+	1:256	22	965	21	+	+	1:4
3	194*	20	+	+	1:64	23	969	20	+	+	0
4	259*	20	+	+	1:8	24	980*	21	+	+	1:8
5	312*	20	+	+	1:4	25	1,017	22	+	+	0
6	320	21	+	+	1:8	26	1,024	22	+	+	0
7	391*	24	+	+	1:64	27	1,037*	23	+	+	1:4
8	479	24	+	+	1:16	28	1,070*	22	+	+	1:32
9	536	21	+	+	1:32	29	1,087*	21	+	+	1:16
10	561*	23	+	+	1:4	30	1,147	24	+	+	1:8
11	624*	21	+	+	1:2	31	1,151*	23	+	+	1:8
12	640*	24	+	+	1:4	32	1,229	21	+	+	0
13	645*	21	+	+	1:2	33	1,249	22	+	+	0
14	662*	21	+	+	1:64	34	1,259	22	+	+	0
15	677	24	+	+	1:4	35	1,280*	21	+	+	1:16
16	718*	20	+	+	1:16	36	1,315*	22	+	+	1:8
17	732*	24	+	+	1:4	37	1,364	22	+	+	0
18	734*	24	+	+	1:64	38	1,434	22	+	+	0
19	928	24	+	+	0	39	1,451*	23	+	+	1:16
20	948	22	+	+	0	40	1,498*	22	+	+	1:8

Determination: \* -Incidence of Syphilis.

**Table 3** Syphilis diagnosed students' social and demographic status.

		Sex				Social status			
Age group	N = 40	Male (n = 8)	Female (n = 32)	Single (n = 26)		Married (n = 6)		Boyfriend (n = 7)	Cohabitant (n = 1)
				Male n = 7	Female n = 19	Male n = 1	Female n = 5	Female n = 7	Female n = 1
	20	5	1	4	1	3		1	
	21	11	1	10	1	7	1	1	1
Age	22	11	2	9	1	5	1	4	
	23	5	2	3	2	1	1	1	
	24	8	2	6	2	3	2		

collected from students who have Syphilis infection proven by On-Site TM Rapid Test. Then screening and confirmation tests for syphilis were performed locally using RPR and TPHA, respectively.

We identified 22 Syphilis incidences during our research, total of 18 students were treating under the control of specialists of National center for communicable disease and other specialists. All 40 syphilis infected students, out of 7 were single male, 1 was married male, 13 were married female and 19 were single female that means single students are more likely to be infected with Syphilis.

National Center for Communicable Disease report from 2002 to 2014 showed that 1.7-5.2% of pregnant women, 0.8-3.1% of blood donors and 2.6-15.8% of frequent customers of STD cabinet, all of which are groups with low risk of STD, were infected with syphilis [2].

As shown in the report "Collected research of Mongolian social indication 2013" which is conducted among age group between 15-49, women and men had sexual intercourse for the first time at the age of 20.4 and 18.6, respectively [4].

In our research, average age of first sexual intercourse was  $18.9 \pm 1.8$  albeit it might be due to their personal attitude and 9 students' first sexual intercourse was at age of 17.

Previous studies have compared the sexual risk behaviors of college students in Asia, America and Pacific Islander [5]. Therefore, studied drug and alcohol usage and how it affects sexual life. The results show that higher usage of drug and alcohol

increased the risk of accidental sexual intercourse and thus increased the chance of infection of sexually transmitted disease [5-7].

During our study, we involved sexual partners of 22 firstly diagnosed students of Syphilis infection and obtained them under the control of sexually transmitted disease department of National Center for Communicable Disease and supplied comprehensive health care.

After we have evaluated students' satisfaction from attitude and concealing of AIDS physician and specialist, which have been scored 100% well by students.

We also found that not using a condom during the latest sexual intercourse was significantly associated with HIV infection, other STI, or bacterial vaginosis (OR 2.16; 95% 1,263.78) among females.

We conclude that while university students are sexually active and there is substantial risk for syphilis, there is little evidence of substantially increased HIV risk among them [8].

Previous studies showed that the prevalence of syphilis infection among students in Benin City was high and a public health concern [9].

## 6. Conclusions

(1) No incidence of HIV identify among university students.

(2) Among University, we have identified 40 syphilis infection students, out of 26 were new incidences.

(3) Single, female students inclin to infect Syphilis by our research.

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