

Integrated Biological and Behavioral Survey among Men Who Have Sex with Men and Transgender Women in Cambodia 2019

Presentation by

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HIV Situation among MSM & TW in Cambodia

– HIV prevalence in MSM

- 2.1% in 2010 (BROS Khmer Study 2010)
- 2.3% in 2014 (HIV sentinel surveillance, 2014)

– HIV prevalence in TW

- 4.2% in 2012 (TW IBBS 2012)
- 5.9% in 2016 (TW IBBS 2016)

– STI prevalence

- No biological STI study in both MSM and TW

History of MSM Size Estimation in Cambodia

- In 2004, first MSM mapping - snowball sampling technique (by FHI 360)
 - 1,500 MSM in Phnom Penh
- In 2008, two studies in 9 provinces:
 - Capture-Recapture methods (FHI 360)
 - Counting MSM population (KHANA)
 - Consensus number of MSM: approximately 21,000
- In 2014, latest study by (NCHADS, KHANA, FHI 360, PSK)
 - Capture-Recapture in 13 provinces : 21000
 - Extrapolate result for the whole country: 31000

History of TW Size Estimation in Cambodia

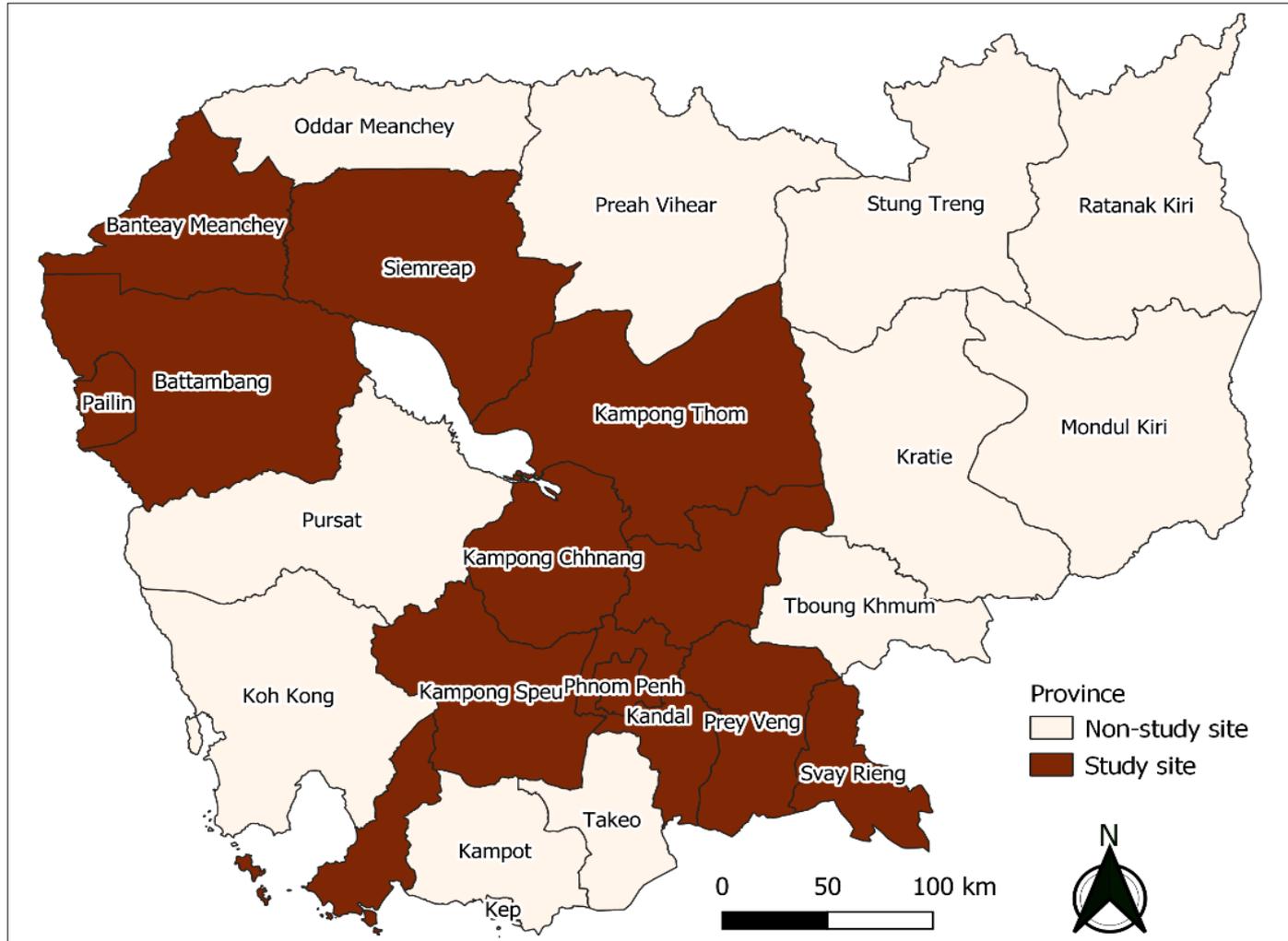
- In 2012, Capture-Recapture in 7 provinces (FHI 360):
 - 2,686 TW in 7 provinces

Objectives

1. Estimate the population size of MSM and TW by province and nationally;
2. Determine the HIV and STI (syphilis, Chlamydia trachomatis, Neisseria gonorrhoea) prevalence among MSM and TW at the national level;
3. Examine sociographic characteristics, sexual behaviors and substance use, HIV service seeking behaviors, and exposure to HIV programs targeting MSM and TW; and
4. Identify factors associated with HIV prevalence among MSM and TW in Cambodia.

Methods

Study Sites (13 provinces)



Study Population

- **Eligibility criteria for MSM:**
 - 18 years of age or older,
 - biological male at birth and **not self-identified as women or third gender,**
 - having anal sex with at least one male (including TW) partner in the past 12 months,
 - able to communicate in Khmer, and
 - able and willing to provide written informed consent

Study Population

- **Eligibility criteria for TG:**
 - 18 years of age or over,
 - **biologically male at birth and self-identified as a woman or third gender,**
 - having anal sex with at least one male in the past 12 months,
 - able to communicate in Khmer, and
 - able and willing to provide written informed consent

Sample size

$$n = DEFF * Z_{1-\alpha/2}^2 * P * (1-P) / d^2$$

For MSM, minimum sample size was estimated to be 1,420

- Expected HIV prevalence at 2.3%,
- Population size at 31,000,
- 95% confidence interval,
- 1.15% margin of error,
- Design effect of 2, and
- Non-response rate at 10%

For TW, minimum sample size was estimated to be 1,066

- Expected HIV prevalence at 5.9%,
- Population size at 3,000
- 95% confidence interval,
- 3% margin of error,
- Design effect of 4, and
- Non-response rate at 10%

Study Sites (13 provinces)

Province	MSM			TW		
	Est. population	Est. sample	Actual sample	Est. population	Est. sample	Actual sample
Banteay Meanchey	1,685	250	269	325	150	113
Battambang	3,306	250	266	324	150	149
Kampong Cham	554	55	51	126	40	36
Kampong Chhnang	691	69	69	42	21	30
Kampong Speu	615	62	56	34	17	26
Kandal	1,089	109	103	517	250	234
Pailin	208	37	73	—	16	5
Phnom Penh	5,563	250	213	1,319	250	221
Kampong Thom	514	51	73	43	22	27
Preah Sihanouk	283	28	19	124	39	19
Prey Veng	48	25	36	20	20	23
Siem Reap	1,264	250	336	549	250	128
Svay Rieng	56	28	5	50	25	14
Total	15,876	1,464	1,569	3,473	1,250	1,025

Study design

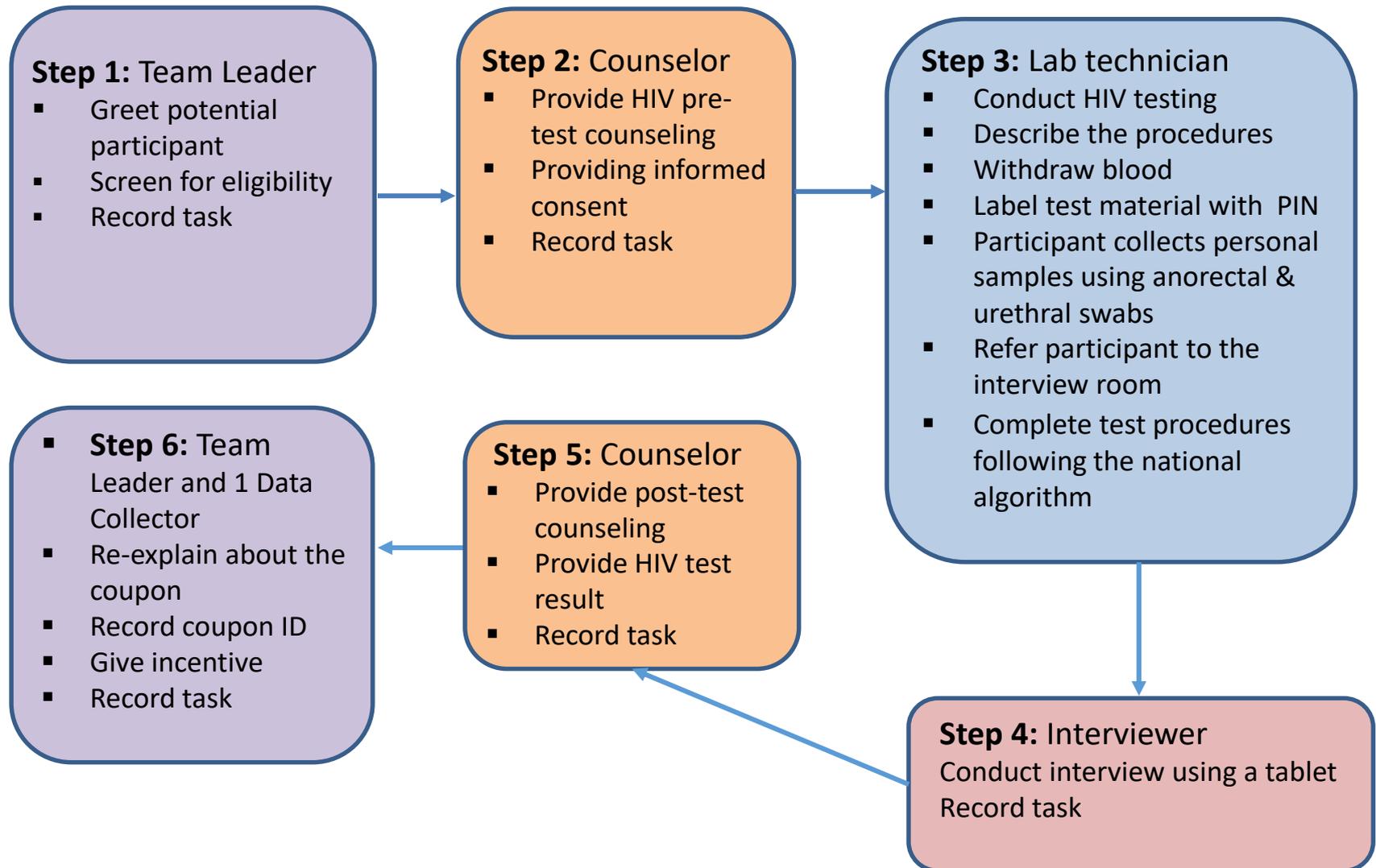
- **Cross-sectional for IBBS**
 - HIV (confirmed) and syphilis rapid tests onsite
 - Chlamydia and gonorrhoea at the NCHADS' STI Reference Laboratory
 - Face-to-face interviews using tablet-based questionnaires
- **Respondent Driven Sampling (RDS) were used**
 - 4 seeds per location
 - 3 coupons per seed/recruiter
 - 2 USD phone card for a successful referral

Study design for size estimates

Service multiplier and object multiplier for size estimation

- **Method #1: Service multiplier ($N=B/m$)**
 - N = Estimate of MSM and TW population size
 - B = Total of unique MSM and TW who received any HIV service from implementing partners under KHANA and RHAC who were notified to NCHADS' National Prevention Database (Data Source #1)
 - m = Proportion of the IBBS sample reported having received any HIV service from implementing partners under KHANA and RHAC catchment areas (Data Source #2)
- **Method #2: Object multiplier ($N=B/m$)**
 - N = Estimate of MSM and TW population size
 - B = Total of unique MSM and TW who got 2 USD phone card (Data Source #1) from survey team
 - m = Proportion of the IBBS sample reported having received 2 USD phone card 3 – 4 weeks previously (Data Source #2)

Data collection procedures



Data analysis

- Descriptive analysis
- Bivariate and multivariate analyses
- Stata 15 (College Station, Texas 77845USA) was used to conduct the data analyses.

Ethical Considerations

- **Ethical approval:**
 - National Ethics Committee for Health Research (NECHR)
- **Oral informed consent:** All participants
- **Confidentiality & privacy protection:**
 - No personal identifier collected
 - Interviews at private places

Results

Size estimation using service multiplier

Using service multiplier						
Province	MSM			TG		
	^B Count	^m Multiplier	^N Estimate	^B Count	^m Multipli er	^N Estimat e
Banteay Meanchey	2,744	81	3,402	666	84	792
Battambang	4,684	63	7,416	521	64	809
Kampong Cham	—	—	—	162	14	1,166
Kampong Chhnang	902	78	1,153	29	63	46
Kampong Speu	615	66	931	56	62	91
Kandal	1,047	48	2,201	405	63	645
Pailin	600	37	1,622	600	40	1,500
Phnom Penh	6,410	61	10,585	1,496	73	2,041
Preah Sihanouk	392	47	828	128	58	221
Prey Veng	515	33	1,545	102	70	147
Siem Reap	1,322	46	2,903	472	70	679
Svay Rieng	42	-	—	70	-	—
Kampong Thom	758	58	1,318	793	67	1,189
Total			34,398			9,326

$$N=B/m$$

Size estimation using object multiplier

Using object multiplier						
Province	MSM			TG		
	Count ^B	Multiplier ^m	Estimate ^N	Count ^B	Multiplier ^m	Estimate ^N
Banteay Meanchey	617	40.9	1,507	166	54.0	308
Battambang	507	38.2	1,329	263	54.5	483
Kampong Cham	92	21.8	422	50	30.8	162
Kampong Chhnang	166	31.4	528	16	21.4	75
Kampong Speu	71	25.0	284	61	78.1	78
Kandal	559	43.3	1,290	185	43.1	429
Pailin	106	34.6	306	19	44.4	43
Phnom Penh	690	34.6	1,997	372	49.3	754
Preah Sihanouk	28	23.5	119	74	56.0	132
Prey Veng	85	37.5	227	51	72.7	70
Siem Reap	340	34.0	1,001	218	38.3	570
Svay Rieng	15	20.0	75	41	68.8	60
Kampong Thom	126	59.7	211	23	64.3	36
Total			9,295			3,199

B = Total of unique MSM and TW who got 2 USD phone card (Data Source #1) from survey team

m = Proportion of the IBBS sample reported having received 2 USD phone card in 3-4 weeks ago

N = Estimate of MSM and TW population size ($N=B/m$)

Final size estimate in 13 provinces

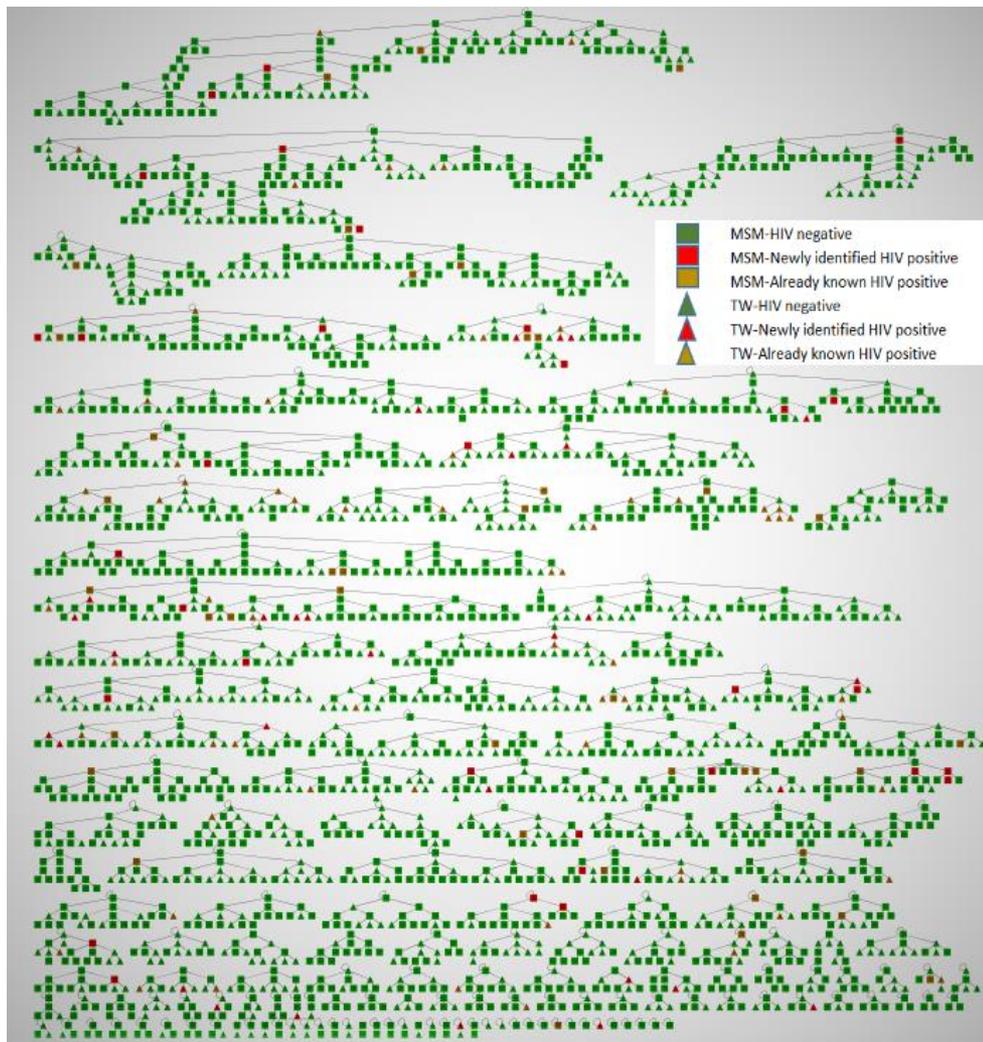
Province	Triangulate data					
	MSM			TW		
	Mean	Min	Max	Mean	Min	Max
Banteay Meanchey	2,454	1,507	3,402	550	308	792
Battambang	4,373	1,329	7,416	646	483	809
Kampong Cham	422	422	422	664	162	1,166
Kampong Chhnang	840	528	1,153	60	46	75
Kampong Speu	607	284	931	85	78	91
Kandal	1,746	1,290	2,201	537	429	645
Pailin	964	306	1,622	771	43	1,500
Phnom Penh	6,291	1,997	10,585	1,398	754	2,041
Preah Sihanouk	473	119	828	177	132	221
Prey Veng	886	227	1,545	108	70	147
Siem Reap	1,952	1,001	2,903	624	570	679
Svay Rieng	75	75	75	60	60	60
Kampong Thom	764	211	1,318	613	36	1,189
Total	21,847	9,295	34,398	6,292	3,170	9,414

Estimation of MSM and TGW in 25 provinces and Phnom Penh

Province	MSM			TGW	
	Male pop. 18-44 Yrs. (a)	Est. MSM 18-44 Yrs. (b)	MSM/100 pop. (b/a*100) (c)	Est. MSM 18-44 Yrs. (c)	MSM/100 pop. (c/a*100)
Banteay Meanchey	154,056	2,454	1.6	550	0.4
Battambang	270,295	4,373	1.6	646	0.2
Kampong Cham	231,283	422	0.2	664	0.3
Kampong Chhnang	108,979	840	0.8	60	0.1
Kampong Speu	171,256	607	0.4	85	0.0
Kandal	267,286	1,746	0.7	537	0.2
Pailin	13,366	964	7.2	771	5.8
Phnom Penh	362,366	6,291	1.7	1398	0.4
Preah Sihanouk	52,833	473	0.9	177	0.3
Prey Veng	236,654	886	0.4	108	0.0
Siem Reap	230,778	1,952	0.8	624	0.3
Svay Rieng	126,427	75	0.1	60	0.0
Kampong Thom	153,644	764	0.5	613	0.4
Kampot*	136,220	1,253	0.9	354	0.3
Koh Kong*	33,246	306	0.9	86	0.3
Kratie*	78,403	721	0.9	204	0.3
Mondul Kiri*	20,666	190	0.9	54	0.3
Preah Vihear*	55,162	507	0.9	143	0.3
Pursat*	98,931	910	0.9	257	0.3
Ratanak Kiri*	42,928	395	0.9	112	0.3
Stung Treng*	30,425	280	0.9	79	0.3
Takeo*	195,445	1,798	0.9	508	0.3
Oddar Meanchey*	50,274	463	0.9	131	0.3
Kep*	11,851	109	0.9	31	0.3
Tboung Khmum*	165,753	1,525	0.9	431	0.3
Total		30,304		8,683	

(*) = result of extrapolation using 0.9 MSM per 100 males and 0.3 TGW per 100 males. These rates were calculated using data of 13 studied provinces.

RDS network



- **164 seeds**
- **3,432 coupons distributed**
 - 2,784 (81.1%) returned
 - 2,616 (94.0%) eligible
 - 2,430 (98.8%) participated
- **HIV+ rate**
 - 6.0% HIV+ (referred by HIV- recruiters)
 - 11.9% HIV+ (referred by HIV+ recruiters)

Age, Marital Status, & education

Sociodemographic	MSM	TW
	(n=1,569)	(n=1,025)
	n (%)	n (%)
Age in years		
Median (IQR)	24 (19 to 30)	26 (22 to 31)
18 – 24	807 (51.6)	388 (37.9)
25 – 34	558 (35.7)	478 (46.7)
≥ 35	198 (12.7)	158 (15.4)
Current marital status		
Married	273 (17.4)	56 (5.5)
Widowed/divorced/separated	56 (3.6)	17 (1.7)
Never married	1206 (76.9)	926 (90.3)
Refused to answer	34 (2.2)	26 (2.5)
Having a cohabiting partner		
Yes	488 (31.2)	289 (28.3)
No	1077 (68.8)	734 (71.8)
Years of formal education level		
Never attended school	53 (3.4)	41 (4.0)
Primary	450 (28.7)	272 (26.6)
High school	891 (56.9)	595 (58.2)
University	172 (11.0)	114 (11.2)

Gender Identity

Sociodemographic	MSM	TW
	(n=1,569)	(n=1,025)
	n (%)	n (%)
Frequency of dressing in female-gendered clothing		
All the time	—	578 (56.4)
Not all the time	—	447 (43.6)
Ever injected hormones		
No	—	883 (86.2)
Yes	—	142 (13.9)
Ever used gel hormones		
No	—	914 (89.2)
Yes	—	111 (10.8)
Ever used pill hormones		
No	—	836 (81.6)
Yes	—	189 (18.4)
Ever used patch hormones		
No	—	1017 (99.2)
Yes	—	8 (0.8)

Number of total sexual partners (life time)

Overall partners	MSM (n=1,569) n (%)	TW (n=1,025) n (%)
# of partners in lifetime		
Median (IQR)	7 (4 to 12)	20 (4 to 58)
# of partners in the past six months		
Median (IQR)	3 (1 to 6)	4 (1 to 10)
0	762 (48.6)	192 (18.7)
1	338 (21.5)	151 (14.7)
2 – 3	295 (18.8)	185 (18.1)
≥ 4	174 (11.1)	497 (48.5)

Male main sexual partners

Male sexual partner	MSM (n=1,569) n (%)	TW (n=1,025) n (%)
Male main sexual partner		
# of male main sexual partners in the past six months		
Median (IQR)	0 (0 to 1)	0 (0 to 1)
0	1095 (69.8)	580 (56.6)
1	292 (18.6)	256 (25.0)
2 – 3	131 (8.4)	106 (10.3)
≥ 4	51 (3.3)	83 (8.1)
Sex role during last sex in the past six months		
Receptive	62 (13.1)	395 (88.8)
Insertive	339 (71.5)	27 (6.1)
Both	73 (15.4)	23 (5.2)
Consistent condom use in the last six months		
Always	216 (45.6)	174 (39.1)
Not always	258 (54.4)	271 (60.9)
Condom use during last sex in the past six months		
Yes	320 (67.5)	318 (71.6)
No	154 (32.5)	126 (28.4)

Male casual sexual partners

Male sexual partner	MSM (n=1,569) n (%)	TW (n=1,025) n (%)
Male casual sexual partners		
# of male casual sexual partners		
Median (IQR)	0 (0 to 1)	2 (0 to 5)
0	1,068 (68.1)	387 (37.8)
1	177 (11.3)	117 (11.4)
2 – 3	212 (13.5)	196 (19.1)
> 4	112 (7.1)	325 (31.7)
Sex role during last sex in the past 6 months		
Receptive	88 (17.6)	570 (89.6)
Insertive	335 (67.1)	39 (6.1)
Both	76 (15.2)	27 (4.3)
Consistent condom use in the past six months		
Always	263 (51.5)	328 (51.2)
Not always	248 (48.5)	313 (48.8)
Condom use during the last sex in the past six months		
Yes	387 (76.2)	536 (83.8)
No	121 (23.8)	104 (16.3)

Male paid sexual partners

	MSM (n=1,569) n (%)	TW (n=1,025) n (%)
Male sexual partner		
Male paid sexual partner		
# of male paid sexual partners in the past six months		
Median (IQR)	0 (0 to 1)	0 (0 to 1)
0	1,336 (85.2)	810 (79.0)
1	94 (6.0)	60 (5.9)
2 – 3	92 (5.9)	74 (7.2)
> 4	47 (3.0)	81 (7.9)
Sex role during last sex in the past six months		
Receptive	40 (17.2)	188 (88.7)
Insertive	156 (67.2)	16 (7.6)
Both	36 (15.5)	8 (3.8)
Consistent condom use in the past six months		
Always	151 (50.3)	157 (56.1)
Not always	149 (49.7)	123 (43.9)
Condom use during last sex in the past six months		
Yes	239 (83.6)	222 (88.8)
No	47 (16.4)	28 (11.2)

Male paying sexual partners

	MSM (n=1,569)	TW (n=1,025)
	n (%)	n (%)
Male sexual partner		
Male paying sexual partner		
# of male paying sexual partners in the past six months		
Median (IQR)	0 (0 to 1)	0 (0 to 1)
0	1316 (83.9)	729 (71.1)
1	105 (6.7)	70 (6.8)
2 – 3	92 (5.9)	88 (8.6)
> 4	56 (3.6)	138 (13.5)
Sex role during last sex in the past six months		
Receptive	45 (5.0)	265 (68.4)
Insertive	159 (87.2)	18 (22.8)
Both	47 (7.6)	11 (8.8)
Consistent condom use in the past six months		
Always	153 (49.7)	196 (56.3)
Not always	155 (50.3)	152 (43.7)
Condom use during last sex in the past six months		
Yes	237 (81.2)	288 (88.6)
No	55 (18.8)	37 (11.4)

TW main sexual partner

TW sexual partners	MSM (n=1,569) n (%)	TW (n=1,025) n (%)
TW main sexual partner		
# of TG main sexual partners in the past six months		
Median (IQR)	0 (0 to 1)	0 (0 to 0)
0	1,136 (72.4)	968 (94.4)
1	239 (15.2)	22 (2.2)
2 – 3	141 (9.0)	23 (2.2)
> 4	53 (3.4)	12 (1.2)
Sex role during last sex in the past 6 months		
Receptive	22 (5.1)	39 (68.4)
Insertive	377 (87.1)	13 (22.8)
Both	33 (7.6)	5 (8.8)
Consistent condom use in the past six months		
Always	218 (49.9)	23 (40.4)
Not always	219 (50.1)	34 (59.7)
Condom use during last sex in the past six months		
Yes	343 (78.5)	42 (73.7)
No	94 (21.5)	15 (26.3)

TW casual sexual partner

TW sexual partners	MSM (n=1,569) n (%)	TW (n=1,025) n (%)
TW casual sexual partner		
# of TG casual sexual partners in the past six months		
Median (IQR)	0 (0 to 1)	0 (0 to 0)
0	1,041 (66.4)	971 (94.7)
1	218 (13.9)	13 (1.3)
2 – 3	222 (14.2)	24 (2.3)
> 4	88 (5.6)	17 (1.7)
Sex role during last sex in the past 6 months		
Receptive	27 (5.1)	31 (57.4)
Insertive	471 (89.2)	17 (31.5)
Both	29 (5.5)	6 (11.1)
Consistent condom used in the past six months		
Always	303 (51.4)	14 (25.5)
Not always	286 (48.6)	41 (74.6)
Condom use during last sex in the past six months		
Yes	472 (81.0)	40 (72.7)
No	111 (19.0)	15 (27.3)

TW paid sexual partner

TW sexual partners	MSM (n=1,569) n (%)	TW (n=1,025) n (%)
TW paid sexual partner		
# of TG bought sexual partners in the past six months		
Median (IQR)	0 (0 to 0)	0 (0 to 0)
0	1,296 (82.6)	991 (96.7)
1	145 (9.2)	14 (1.4)
2 – 3	92 (5.9)	15 (1.5)
> 4	36 (2.3)	5 (0.5)
Sex role during last sex in the past six months		
Receptive	14 (5.2)	22 (66.7)
Insertive	238 (87.5)	7 (21.2)
Both	20 (7.4)	4 (12.1)
Consistent condom use in the past six months		
Always	151 (53.0)	16 (47.1)
Not always	134 (47.0)	18 (52.9)
Condom use during last sex in the past six months		
Yes	235 (83.6)	30 (88.2)
No	46 (16.4)	4 (11.8)

TW paying sexual partner

TW sexual partners	MSM (n=1,569) n (%)	TW (n=1,025) n (%)
TW paying sexual partner		
# of TW selling sexual partners in the past six months		
Median (IQR)	0 (0 to 0)	---
0	1,320 (84.1)	---
1	122 (7.8)	---
2 – 3	99 (6.3)	---
> 4	28 (1.8)	---
Sex role during last sex in the past six months		
Receptive	11 (5.6)	---
Insertive	168 (84.9)	---
Both	19 (9.6)	---
Consistent condom use in the past six months		
Always	175 (49.4)	---
Not always	179 (50.6)	---
Condom use during last sex in the past six months		
Yes	270 (83.3)	---
No	54 (16.7)	---

Female main sexual partner

Female sexual partner	MSM (n=1,569) n (%)	TW (n=1,025) n (%)
Female main sexual partner		
# of women main sexual partners in the past six months		
Median (IQR)	0 (0 to 1)	—
0	1,090 (69.5)	—
1	295 (18.8)	—
2 – 3	133 (8.5)	—
> 4	51 (3.3)	—
Consistent condom use in the past six months		
Always	220 (44.9)	—
Not always	270 (55.1)	—
Condom use during last sex in the past six months		
Yes	336 (68.7)	—
No	153 (31.3)	—

Female casual sexual partner

Female sexual partner	MSM (n=1,569) n (%)	TW (n=1,025) n (%)
Female casual sexual partner		
# of casual female partners in the last six months		
Mean (+ SD)	0.6 (1.6)	_____
Median (IQR)	0 (0 to 1)	_____
0	1,149 (73.2)	_____
1	194 (12.4)	_____
2 – 3	171 (10.9)	_____
> 4	55 (3.5)	_____
Consistent condom use in the past six months		
Always	218 (50.6)	_____
Not always	213 (49.4)	_____
Condom use during last sex in the past six months		
Yes	349 (81.2)	_____
No	81 (18.8)	_____

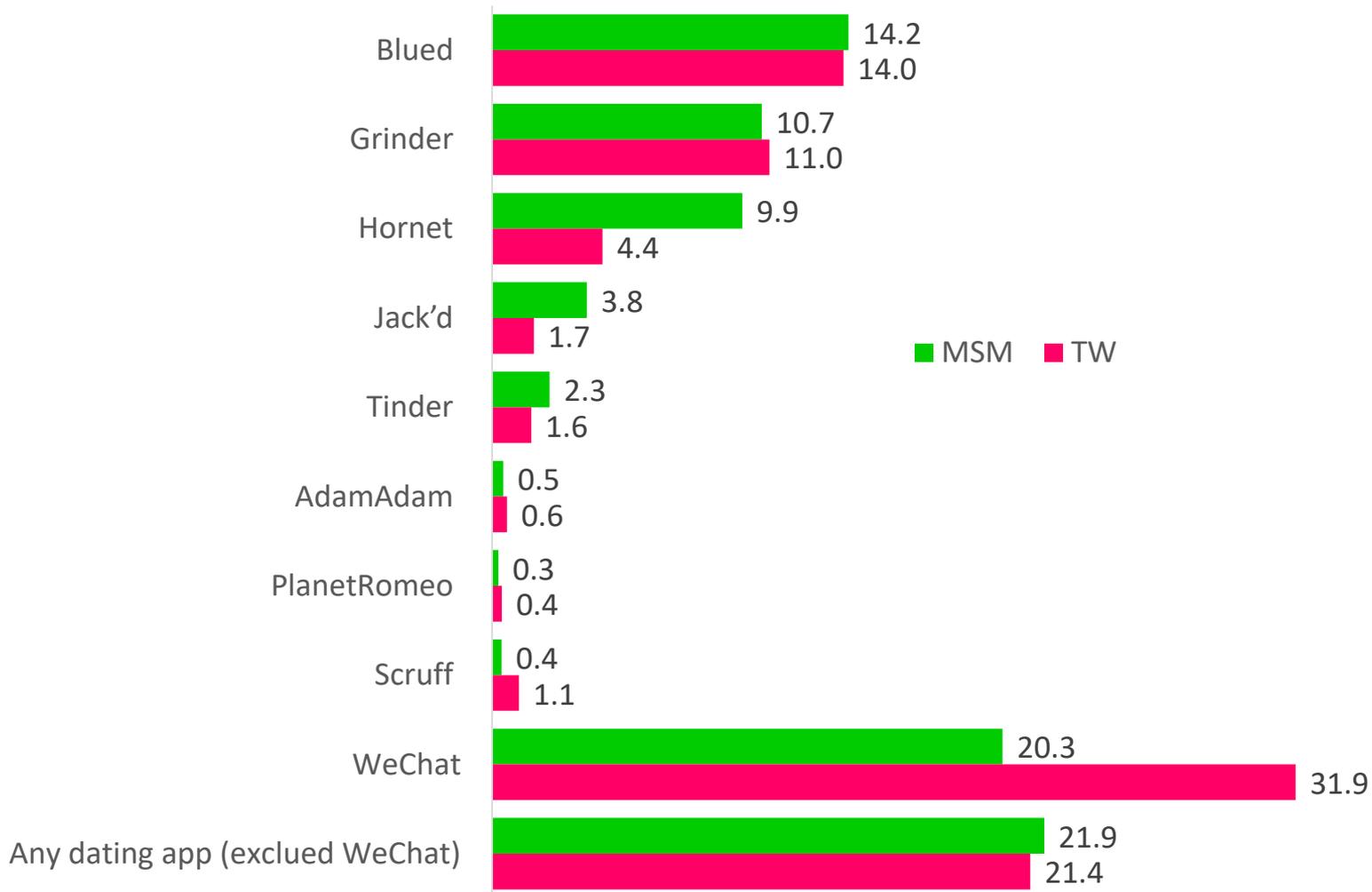
Female paid sexual partner

Female sexual partner	MSM (n=1,569) n (%)	TW (n=1,025) n (%)
Female paid sexual partner		
# of female paid sexual partners in the past six months		
Median (IQR)	0 (0 to 0)	—
0	1,340 (85.4)	—
1	125 (8.0)	—
2 – 3	80 (5.1)	—
> 4	24 (1.5)	—
Consistent condom use in the past six months		
Always	165 (47.6)	—
Not always	182 (52.5)	—
Condom use during last sex in the past six months		
Yes	257 (84.3)	—
No	48 (15.7)	—

Female paying sexual partner

Female sexual partner	MSM (n=1,569) n (%)	TW (n=1,025) n (%)
Female casual sexual partner		
# of women paying sexual partners in the past six months		
Median (IQR)	0 (0 to 0)	—
0	1,356 (86.4)	—
1	120 (7.7)	—
2 – 3	67 (4.3)	—
> 4	26 (1.7)	—
Consistent condom use in the past six months		
Always	161 (50.0)	—
Not always	161 (50.0)	—
Condom use during last sex in the past six months		
Yes	241 (85.8)	—
No	40 (14.2)	—

Utilization of dating app



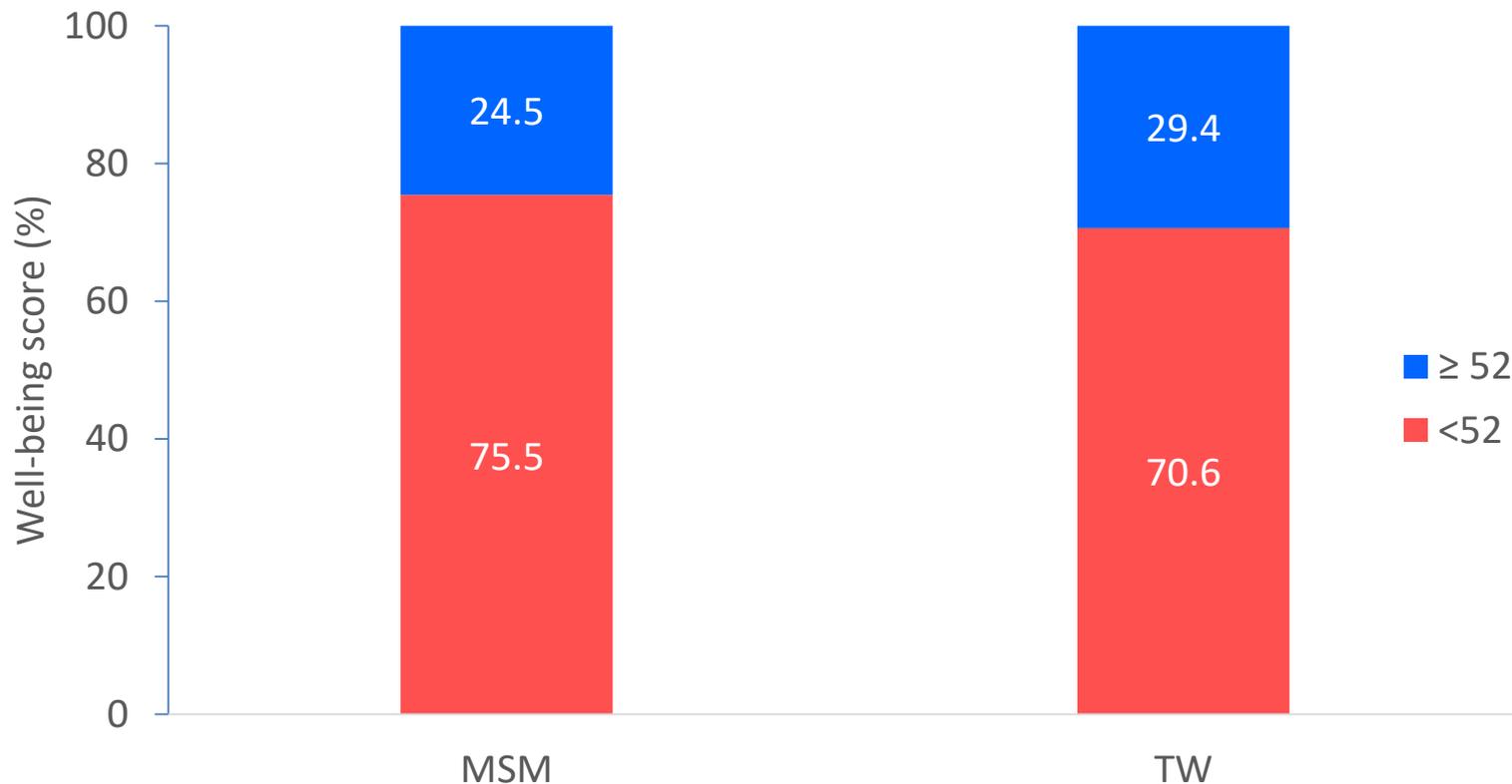
HIV testing

HIV testing	MSM (n=1,569) n (%)	TW (n=1,025) n (%)
Time since the last test for HIV		
Never tested	551 (35.1)	232 (22.6)
Last six months	665 (42.4)	547 (53.4)
7 – 12 months	142 (9.1)	113 (11.0)
> 12 Months	211 (13.5)	133 (13.0)
Place for the last test		
Private facility	52 (5.1)	15 (1.9)
Public facility	183 (18.0)	65 (8.2)
NGO facility	239 (23.5)	287 (36.2)
NGO outreach worker	544 (53.4)	427 (53.8)

Substance use

Substance use	MSM (n=1,569) n (%)	TW (n=1,025) n (%)
Binge drink (drank six or more drinks on one occasion) in the past 12 months		
Never	485 (31.8)	455 (45.7)
less than monthly	574 (37.6)	299 (30.1)
Monthly	195 (12.8)	112 (11.3)
Weekly	196 (12.8)	92 (9.3)
Daily or almost daily	77 (5.0)	37 (3.7)
Drugs in the past 12 months		
Never	1,295 (82.5)	956 (93.3)
Yes, ATS (Yama, crystal ice, ecstasy)	237 (15.1)	62 (6.1)
Other (marijuana, heroin, etc.)	37 (2.4)	7 (0.7)
Injected any illicit drugs in the past three months		
Never	1,557 (99.2)	1,020 (99.5)
Heroin/opioid	3 (0.2)	2 (0.2)
ATS	9 (0.6)	3 (0.3)

Well-being

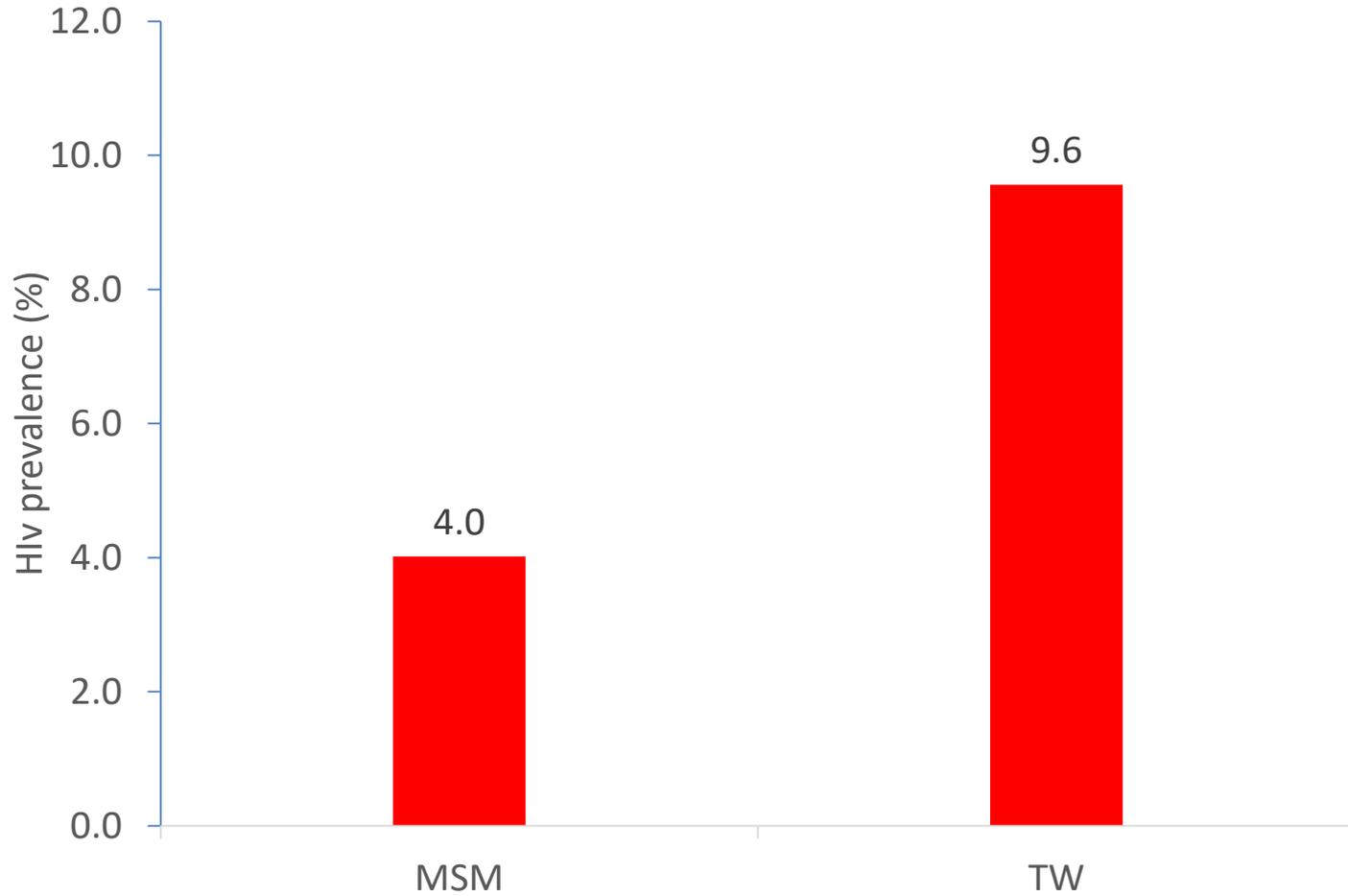


Measure was adopted from WHO (Five) Well-Being Index, score ranges from 0 to 100. Score of less than 52 out of 100 indicates poor well-being that may need support.

Access to HIV prevention program

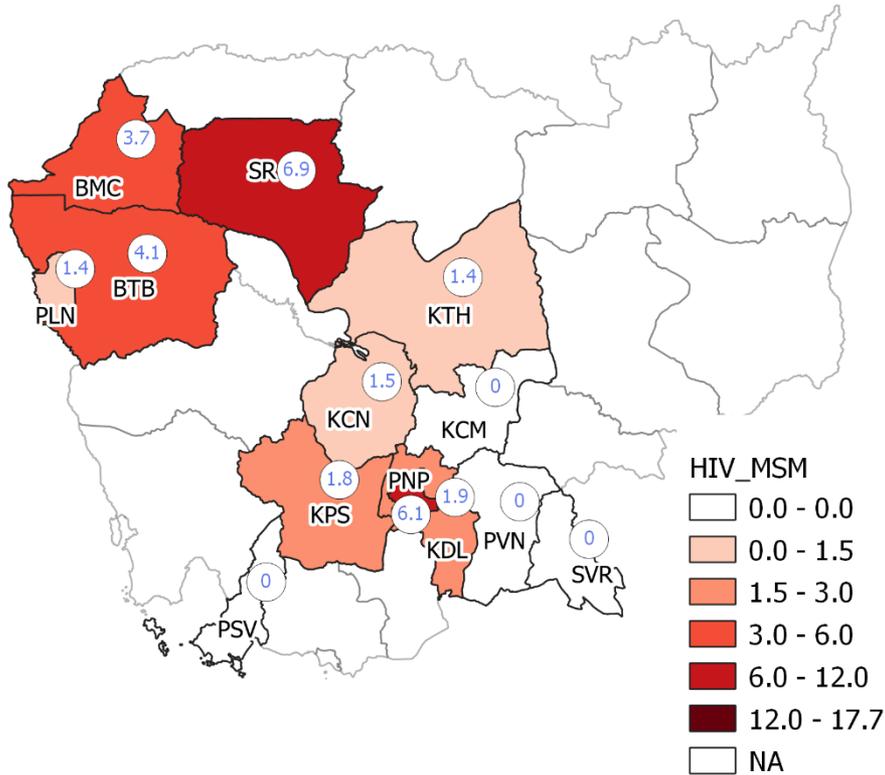
HIV Program	MSM (n=1,569) n (%)	TW (n=1,025) n (%)
Ever received service(s) from HIV program		
Yes	1,073 (68.8)	824 (81.3)
No	487 (31.2)	190 (18.7)
Time since the last met		
Last month	391 (36.7)	293 (35.7)
Last three months	358 (33.6)	264 (32.2)
Last 12 months	172 (16.1)	169 (20.6)
> 12 months	145 (13.6)	94 (11.5)
Items received		
Nothing	54 (3.4)	21 (2.1)
Condoms	1,002 (63.9)	770 (75.1)
Lubricant	898 (57.2)	713 (69.6)
Pamphlet or Brochure	650 (41.4)	519 (50.6)
Medicines	21 (1.3)	10 (1.0)
Serviced received		
Nothing	71 (4.5)	37 (3.6)
HIV testing	862 (54.9)	662 (64.6)
Training on condom use	924 (58.9)	724 (70.6)
Counselling on risk	786 (50.1)	614 (59.9)
Referral	309 (19.7)	246 (24.0)

HIV prevalence

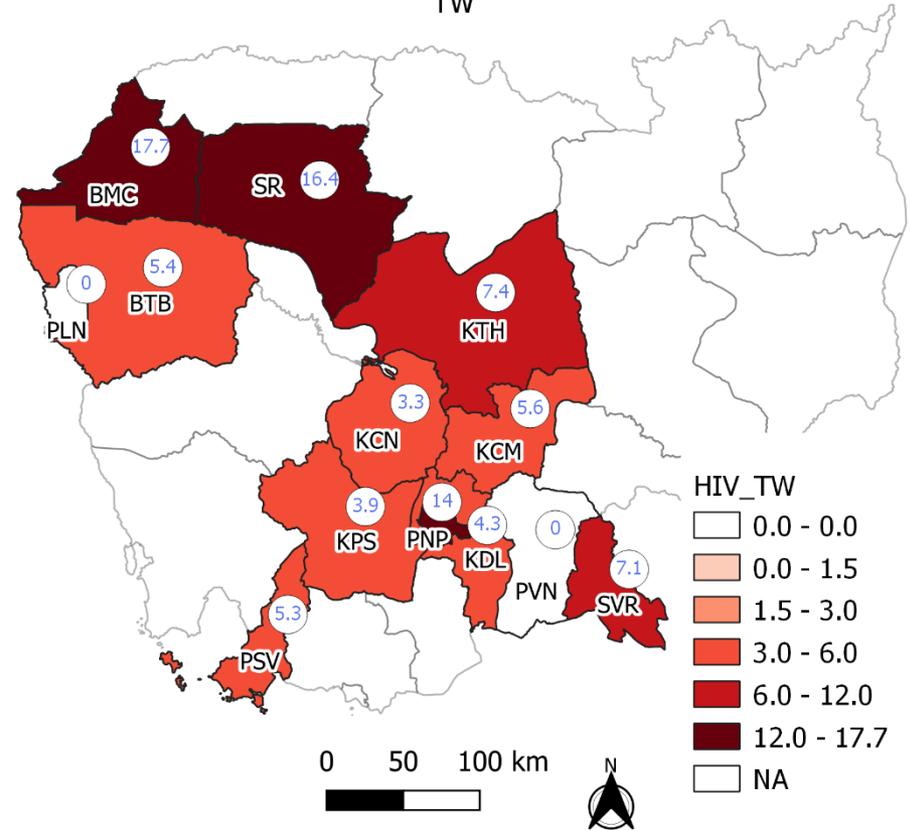


HIV prevalence by province

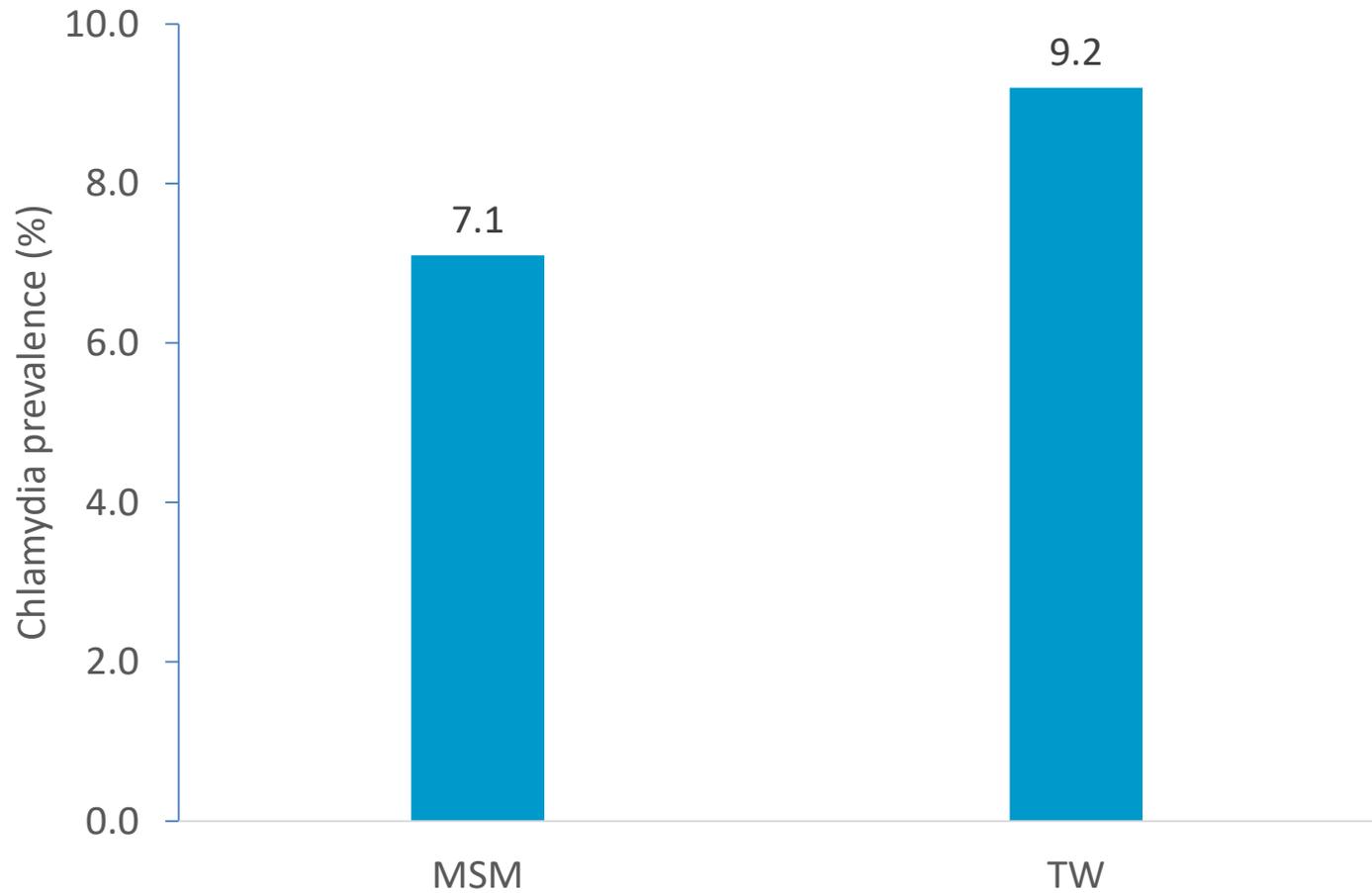
MSM



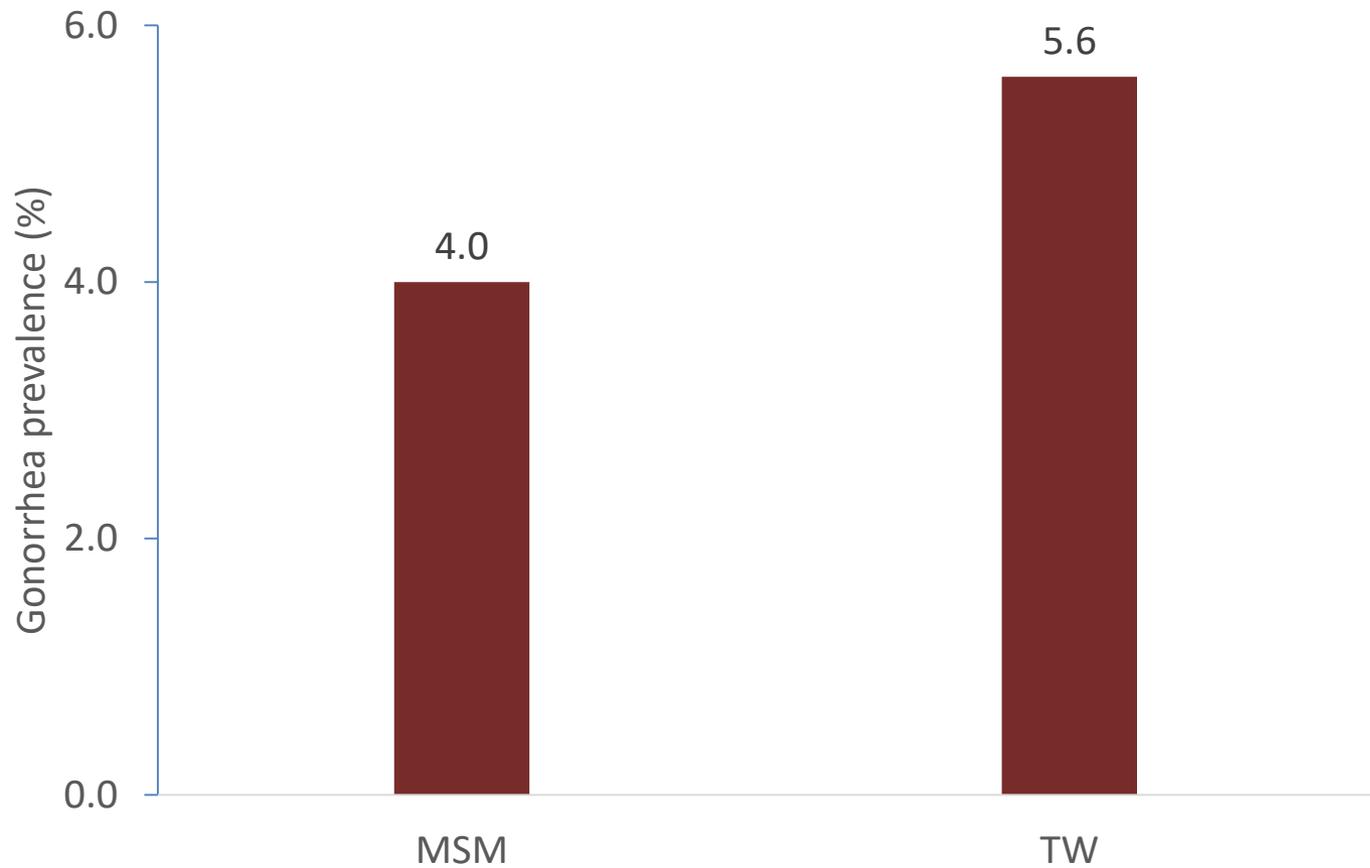
TW



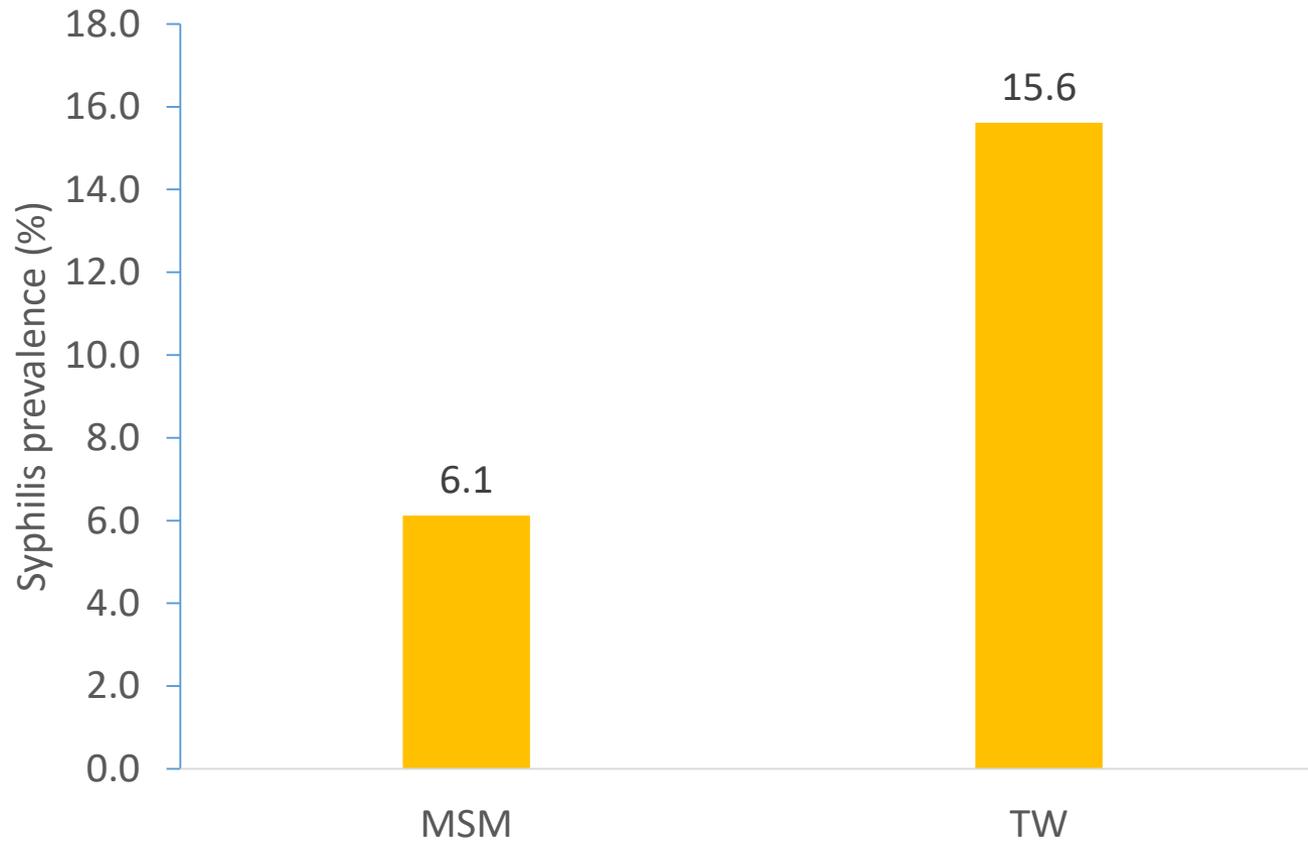
Chlamydia prevalence



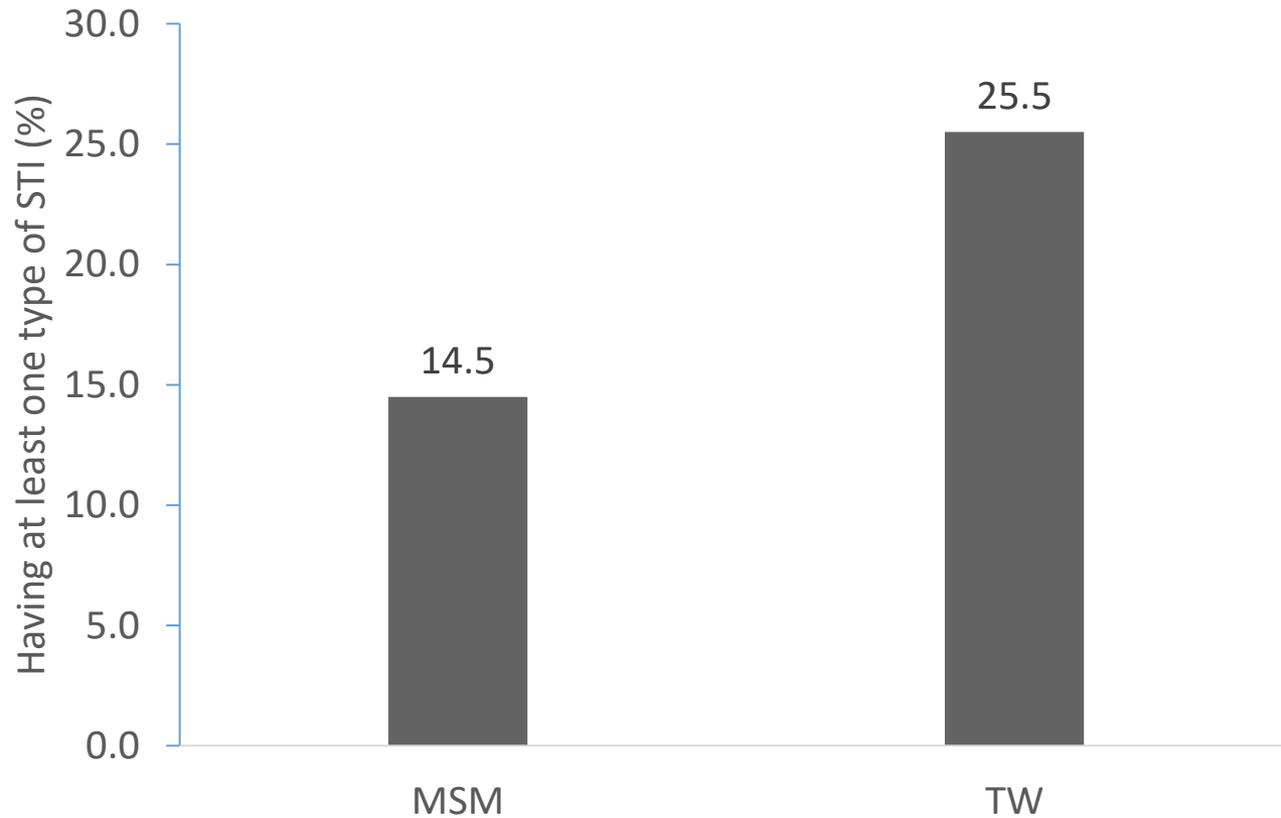
Gonorrhoea prevalence



Syphilis prevalence



Any STI prevalence



Independent factors associated with HIV prevalence

	MSM		TW	
	AOR (95% CI)	P-value	AOR (95% CI)	P-value
Age in year				
18 – 24	Ref.		Ref.	
25 – 34	1.9 (1.1, 3.4)	0.02	2.2 (1.2, 3.8)	0.008
≥ 35	1.3 (0.5, 3.1)	0.6	4.0 (2.1, 7.9)	<0.001
Having a cohabiting partner				
No	—		2.4 (1.3, 4.2)	0.003
Yes	—		Ref.	
Monthly income in the past six months (USD)				
No income	—		4.6 (1.7, 12.8)	0.003
< 100	—		1.0 (0.4, 2.8)	0.993
100 – 199	—		2.1 (0.9, 4.8)	0.099
200 – 299	—		2.1 (0.9, 4.7)	0.086
≥ 300	—		Ref.	
Used any dating app at least once a month in the past 12 months				
No	Ref.		—	
Yes	3.4 (2.0, 5.8)	<0.001	—	
Used WeChat				
No	—		Ref.	
Yes	—		1.8 (1.1, 2.8)	0.015
Syphilis				
Negative	Ref.		Ref.	
Positive	13.3 (7.4, 24.2)	<0.001	3.7 (2.3, 6.0)	<0.001

Sexual behaviors among known vs. newly identified HIV+

	HIV test result					
	MSM			TW		
	Known HIV+	Newly identified HIV+	P-value	Known HIV+	Newly identified HIV+	P-value
	(n=36) n (%)	(n=28) n (%)		(n=66) n (%)	(n=33) n (%)	
# of main male partners in the last six months						
0	18 (50.0)	16 (57.1)	0.595	39 (59.1)	23 (69.7)	0.694
1	13 (36.1)	6 (21.4)		14 (21.2)	6 (18.2)	
2 – 3	3 (8.3)	4 (14.3)		6 (9.1)	1 (3.0)	
≥ 4	2 (5.6)	2 (7.1)		7 (10.6)	3 (9.1)	
Consistent condom use in the last six months with main male partners						
Always	8 (44.4)	6 (50.0)	1	16 (59.3)	3 (30.0)	0.151
Not always	10 (55.6)	6 (50.0)		11 (40.7)	7 (70.0)	
# of casual male partners in the last six months						
0	22 (61.1)	12 (42.9)	0.441	18 (27.3)	8 (24.2)	0.792
1	1 (2.8)	2 (7.1)		5 (7.6)	4 (12.1)	
2 – 3	6 (16.7)	5 (17.9)		14 (21.2)	5 (15.2)	
≥ 4	7 (19.4)	9 (32.1)		29 (43.9)	16 (48.5)	
Consistent condom use in the last six months with casual male partners						
Always	8 (53.3)	7 (43.8)	0.724	29 (59.2)	12 (48.0)	0.46
Not always	7 (46.7)	9 (56.3)		20 (40.8)	13 (52.0)	

Sexual behaviors among known vs. newly identified HIV+

	HIV test result					
	MSM			TW		
	Known HIV+	Newly identified HIV+	P-value	Known HIV+	Newly identified HIV+	P-value
	(n=36) n (%)	(n=28) n (%)		(n=66) n (%)	(n=33) n (%)	
# of men you bought sex in the last six months						
0	29 (80.6)	22 (78.6)	0.829	50 (75.8)	28 (84.9)	0.691
1	3 (8.3)	1 (3.6)		1 (1.5)	0 (0.0)	
2 – 3	2 (5.6)	2 (7.1)		6 (9.1)	3 (9.1)	
≥ 4	2 (5.6)	3 (10.7)		9 (13.6)	2 (6.1)	
Consistent condom use in the last six months with men you bought sex						
Always	4 (50.0)	3 (50.0)		12 (66.7)	5 (71.4)	1
Not always	4 (50.0)	3 (50.0)		6 (33.3)	2 (28.6)	
# of male paying partners in the last six months						
0	28 (77.8)	20 (71.4)	0.924	37 (56.1)	23 (69.7)	0.44
1	3 (8.3)	2 (7.1)		5 (7.6)	3 (9.1)	
2 – 3	2 (5.6)	2 (7.1)		3 (4.6)	0 (0.0)	
≥ 4	3 (8.3)	4 (14.3)		21 (31.8)	7 (21.2)	
Consistent condom use in the last six months with male paying partners						
Always	5 (55.6)	3 (37.5)	0.637	22 (64.7)	7 (58.3)	0.737
Not always	4 (44.4)	5 (62.5)		12 (35.3)	5 (41.7)	

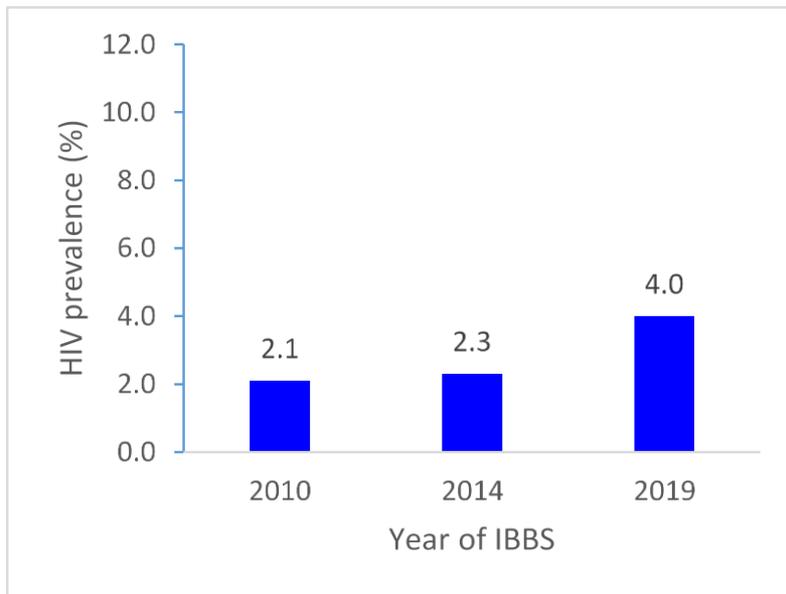
Discussion

Increasing HIV prevalence

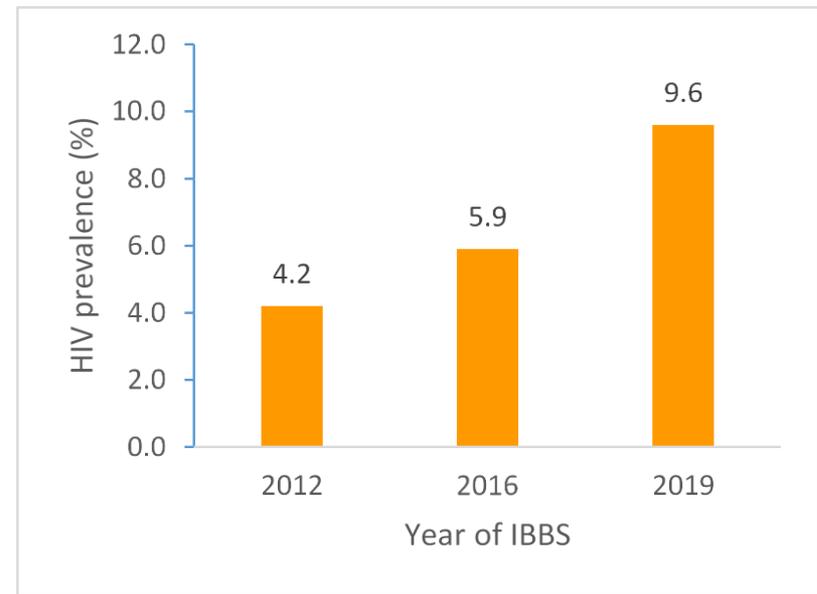
HIV prevalence was on upward trends, but not surprising due to

- High ART coverage
- Low mortality rate among PLHIV
- New infections remain

a) Trends of HIV prevalence among MSM from IBBS between 2010 and 2019



b) Trends of HIV prevalence among TW from IBBS between 2012 and 2019



First 90% target

The proportion of PLHIV who have known their HIV status, remained low

- At 57.1% for MSM and 67.4% for TW
- For TW, the proportion of 67.4% was slightly higher than 48% in TW IBBS 2016
- For MSM, this is the first time this information has been collected.

This may require additional innovative approaches to improve testing rates including HIV self-testing for MSM and TW.

Second 90% target

100% of those who knew their HIV status receiving ART

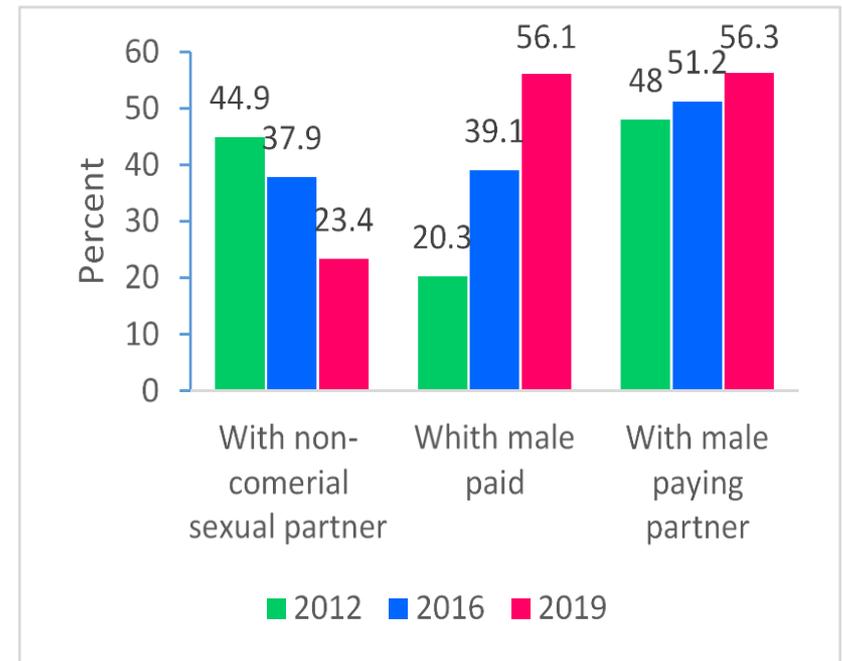
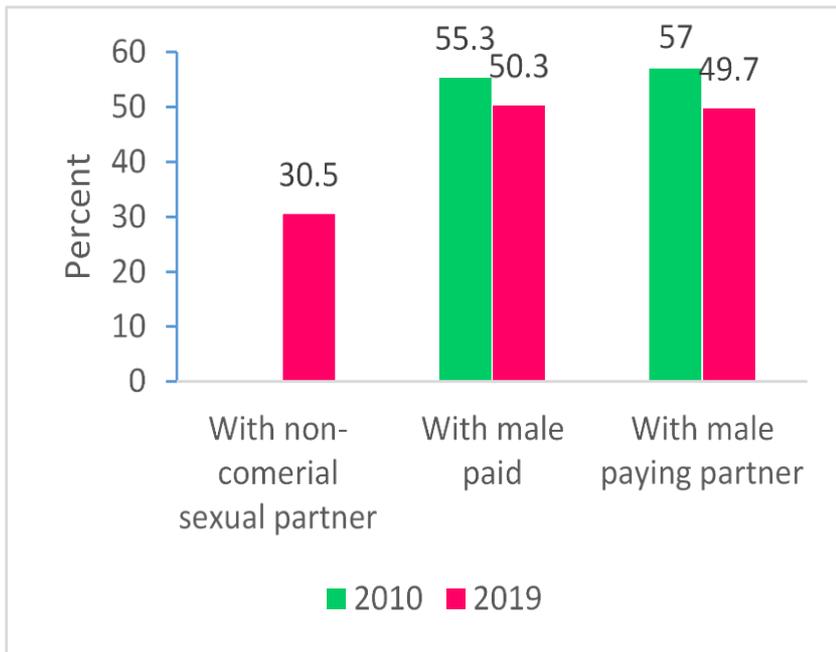
- A real achievement
- This is critical for treatment as prevention
- This may have averted many new infections

Current efforts should be maintained.

Low consistent condom use

a) Trends of consistent condom use among MSM from IBBS between 2010-2019

b) Trends of consistent condom use among TW from IBBS between 2012-2019



- This suggests that prevention alternatives to regular condom use such as Pre-Exposure Prophylaxis (PrEP) should be considered

Low consistent condom use (cont.)

Low consistent condom use among those who knew their HIV status

- The rate was low at about 50% in overall in the past six months with any partner.

Interventions should encourage those who are in HIV care and treatment to protect their sexual partners and positive prevention be prioritized.

Limitations

- RDS without weighting data due to unreliable sizes of networks reported and collected.
- Information bias
 - Local interviewers
 - Recall bias

Conclusions

Conclusion

- Our study estimated 21,847 MSM and 6,292 TW in 12 provinces and Phnom Penh.
- HIV prevalence in MSM and TW is on the rise
 - Half the positives knew their status and were on treatment contributing to the increased prevalence
- The fact that 100% of those who knew their HIV status were on ART is an achievement

Conclusion (cont.)

However, many remaining challenges need to be solved for both groups;

- The high proportion of those testing positive for HIV who were not aware of their status;
- low HIV testing rates;
- low consistent condom use with casual, paid, and paying sexual partners;
- low condom use rates among known HIV positive MSM and TW;
- high STI prevalence (syphilis, chlamydia, and gonorrhoea);
- Dating apps and social media like WeChat make casual sex easier; and
- TW with low income had additional risk to HIV infection

Recommendation

- To address low HIV testing rates,
 - HIV self-testing and online linkage, Peer Driven Intervention Plus (PDI+) should be expanded, and
 - other innovative approaches should be explored
- To address low condom use,
 - Targeted condom promotion and, alternative prevention methods to condom use like Pre-Exposure Prophylaxis (PrEP) should be expanded.
- Positive prevention interventions that encourage those who are in HIV care and treatment to protect their sexual partners should be prioritized and include PrEP for negative partners.

Recommendation (cont.)

- STI education, and STI testing services should be included as part of the existing programs specialized for MSM and TW.
- Scaling up online prevention services to reach online users is an urgent need.
 - Further studies to understand the socio-demographic characteristics, perception, and risky behaviors to HIV infection should be done.
- To support TW with low/no income with additional risk for HIV infection, social safety net interventions aimed at stabilizing their living standards should also be considered.

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Thank you!
Q & A