

Table 2 Sexual behavior of participants by age group and gender

Variables	Age group and gender																F(df1, df2)	
	15–19		20–24		25–34		35–44		45–54		55–59		Total		M	W		
	M	W	M	W	M	W	M	W	M	W	M	W	M	W	M	W		
N (weighted, unweighted) ^a	208, 197	141, 122	175, 151	192, 158	220, 239	262, 249	152, 179	266, 300	166, 181	225, 230	72, 63	60, 69	993, 1010	1145, 1128				
Ever had sex (%) ^b	43.7	36.1	87.7	65.4	94.8	84.4	96.9	91.5	99.9	90.0	100.0	88.1	84.4	78.2	55.80***	30.66***	(3.65, 354.16) (4.29, 416.38)	
F(df1, df2)	1.00		17.62 ^{ttt}		9.49 ^{tt}		3.17		82.17 ^{ttt}		11.56 ^{tt}		8.58 ^{tt}					
First sex before age 15 (%) ^b	11.4	11.4	16.4	2.2	8.9	1.2	4.9	1.1	3.5	1.5	0.0	0.8	8.6	2.6	4.07**	6.07***	(4.63, 448.60) (3.62, 352.46)	
F(df1, df2)	1.15		13.39 ^{ttt}		12.64 ^{ttt}		3.82 ^t		3.30 ^t		13.58 ^{ttt}		13.58 ^{ttt}					
N (weighted, unweighted) ^c	89, 86	45, 38	150, 129	123, 103	206, 225	211, 208	143, 170	231, 267	161, 174	196, 195	71, 62	51, 58	820, 846	857, 869				
Mean age at first sex (SE)	15.3	15.0	16.4	18.1	18.3	21.0	19.0	22.3	19.7	23.1	20.3	24.0	18.2	21.3	40.05***	127.21***	(5, 93) (5, 93)	
t(df)	1.00		-5.54 ^{ttt}		-6.48 ^{ttt}		-7.34 ^{ttt}		-5.71 ^{ttt}		-4.40 ^{ttt}		-12.59 ^{ttt}					
First sex before age 15 (%) ^b	26.9	37.6	19.1	3.5	9.4	1.4	5.3	1.3	3.6	1.7	0.0	0.9	10.4	3.5	8.00***	19.70***	(4.61, 446.92) (3.61, 349.67)	
F(df1, df2)	0.48	(1, 58)	10.88 ^{tt}		11.98 ^{tt}		4.20 ^t		0.46	(1, 92)	1.36	(1, 62)	14.42 ^{ttt}					
Type of first sexual partner (%) ^d															11.97***	15.18***	(10.97, 1063.66) (7.51, 727.97)	
Spouse	1.4	11.5	0.3	38.7	4.8	46.3	10.8	73.7	16.5	87.6	24.1	93.3	8.6	63.0				
Bf/Gf	89.6	88.5	80.8	59.0	74.0	48.9	53.6	24.6	31.1	9.2	29.9	4.9	61.1	34.2				
Casual	9.0	0.0	19.0	2.4	18.0	4.8	22.0	1.7	18.8	3.2	13.8	1.7	17.7	2.8				
CSW	0.0	0.0	0.0	0.0	3.2	0.0	13.6	0.0	33.5	0.0	32.2	0.0	12.5	0.0				
F(df1, df2)	4.44 ^t		48.26 ^{ttt}		18.97 ^{ttt}		46.75 ^{ttt}		46.34 ^{ttt}		19.25 ^{ttt}		143.12 ^{ttt}					
Mean number of lifetime sexual partners (SE)	5.4	5.0	10.6	3.6	9.0	2.8	12.3	1.7	18.4	1.3	15.0	1.3	11.9	2.3	4.98***	3.19*	(5, 93) (5, 93)	
t(df)	0.20		4.16 ^{ttt}		4.50 ^{ttt}		5.96 ^{ttt}		3.01 ^{tt}		2.46 ^t		7.11 ^{ttt}					
Number of lifetime partners (%) ^d															1.60	4.16***	(14.06, 1363.33) (13.59, 1318.59)	
1	17.1	45.8	16.8	51.2	12.0	55.9	13.6	68.3	17.4	83.7	32.3	79.3	16.6	65.8				
2	16.2	19.7	8.5	18.8	10.2	22.3	11.9	22.1	11.1	10.9	9.4	16.3	10.9	18.7				

Table 2 continued

Variables	Age group and gender															
	15–19		20–24		25–34		35–44		45–54		55–59		Total		F(df1, df2)	
	M	W	M	W	M	W	M	W	M	W	M	W	M	W	M	W
3–4	29.2	18.9	19.5	16.0	20.7	16.7	24.4	8.4	17.8	4.2	17.0	4.3	21.1	10.9		
5–9	26.2	8.7	19.6	9.2	30.3	3.5	24.0	0.6	19.5	1.0	13.7	0.0	23.2	3.0		
C10	11.3	6.8	35.7	4.9	26.8	1.7	26.2	0.5	34.3	0.2	27.6	0.0	28.2	1.6		
F(df1, df2)	2.82 ^t (3.22, 186.80)		11.57 ^{ttt} (3.92, 337.39)		27.55 ^{ttt} (3.43, 318.99)		44.31 ^{ttt} (3.29, 299.69)		45.07 ^{ttt} (3.32, 305.44)		7.12 ^{ttt} (3.84, 237.87)		115.15 ^{ttt} (3.48, 337.16)			
In the past 12 months ^b																
Bought sex (%) ^b	1.8	0.0	5.0	1.4	12.5	0.2	12.3	0.5	7.4	0.0	2.4	0.0	8.1	0.4	3.25 ^{**} (4.59, 444.87)	0.77 (3.64, 353.26)
F(df1, df2)	1.07 (1, 58)		1.51 (1, 86)		79.15 ^{ttt} (1, 93)		43.45 ^{ttt} (1, 91)		13.04 ^{ttt} (1, 92)		1.26 (1, 62)		59.98 ^{ttt} (1, 97)			
Sold sex (%) ^b	0.0	1.9	0.7	1.4	0.3	0.0	0.5	0.4	0.3	0.0	0.0	0.0	0.3	0.4	0.31 (3.35, 325.37)	1.36 (4.14, 401.46)
F(df1, df2)	1.95 (1, 58)		0.27 (1, 86)		1.02 (1, 93)		0.03 (1, 91)		1.21 (1, 92)		NA		0.06 (1, 97)			
Had casual sex (%) ^b	31.6	9.0	29.7	3.2	21.3	2.5	9.3	0.9	7.2	0.0	2.1	0.0	17.4	1.8	7.82 ^{***} (4.21, 408.34)	3.66 [*] (4.55, 441.66)
F(df1, df2)	7.74 ^{tt} (1, 58)		23.78 ^{ttt} (1, 86)		25.53 ^{ttt} (1, 93)		34.24 ^{ttt} (1, 91)		8.48 ^{tt} (1, 92)		0.83 (1, 62)		132.19 ^{ttt} (1, 97)			
Had sex with regular partner (%) ^b	60.0	80.1	76.6	81.8	82.7	85.0	81.9	82.7	72.3	62.2	72.1	39.7	76.0	75.8	3.46 [*] (4.68, 454.26)	10.50 ^{***} (4.56, 442.27)
F(df1, df2)	4.16 ^t (1, 58)		1.00 (1, 86)		0.24 (1, 93)		0.04 (1, 91)		2.42 (1, 92)		11.57 ^{tt} (1, 62)		0.01 (1, 97)			

M men, W women, SE standard error, Bf boyfriend, Gf girlfriend. CSW commercial sex worker

Significance levels for tests across age groups within gender are represented by *p<.05, **p<.01, and ***p<.001. For categorical variables, significance is based on the adjusted F (a variant of the second-order Rao–Scott adjusted chi square statistic) and its degrees of freedom. The adjusted F is a variant of the second-order Rao–Scott adjusted chi square statistic. For continuous variable, significance is based on the one-way analysis of variance (ANOVA). Significance levels for tests between genders within age group are represented by ^tp<.05, ^{tt}p<.01, and ^{ttt}p<.001. For categorical variables, significance is based on the adjusted F (a variant of the second-order Rao–Scott adjusted chi square statistic) and its degrees of freedom. The adjusted F is a variant of the second-order Rao–Scott adjusted chi square statistic. For continuous variables, significance is based on independent sample t-test

^a All participants

^b Percentages are of those who responded “Yes” to the question only

^c Only sexually experienced participants. Sample size varies slightly across variables due to item non-response

^d Percentages are of column weighted N. Totals of percentages may differ from 100 due to rounding

Table 3 Percentage of participants who responded "Acceptable" to each sexual attitude item by age group and gender

Attitudes	Age group and gender															
	15-19		20-24		25-34		35-44		45-54		55-59		Total		F(df1, df2)	
	M	W	M	W	M	W	M	W	M	W	M	W	M	W	M	W
N (weighted, unweighted)	208, 197	141, 122	175, 151	192, 158	220, 239	262, 249	152, 179	266, 300	166, 181	225, 230	72, 63	60, 69	993, 1010	1145, 1128		
Premarital sex (%)																
Male adolescent	48.8	44.2	63.9	54.2	66.3	53.8	48.4	43.4	50.8	37.4	50.8	28.0	55.8	45.7	3.06*	3.44**
F(df1, df2)	0.44 (1, 86)		1.41 (1, 92)		5.65 ^t (1, 95)		0.66 (1, 91)		3.99 ^t (1, 93)		5.10 ^t (1, 64)		15.73 ^{ttt} (1, 97)		(4.48, 434.08)	(4.50, 436.50)
Female adolescent	39.4	37.9	59.4	50.5	58.6	47.8	40.7	34.5	43.3	31.2	45.3	15.4	48.5	39.0	4.19**	5.09***
F(df1, df2)	0.05 (1, 86)		1.09 (1, 92)		4.18 ^t (1, 95)		1.15 (1, 91)		4.32 ^t (1, 93)		12.93 ^{tt} (1, 64)		12.92 ^{tt} (1, 97)		(4.49, 435.58)	(4.51, 437.68)
Middle-aged man	45.5	45.7	66.6	54.9	75.1	64.9	71.3	65.0	77.6	70.6	78.1	62.8	67.4	61.9	10.12***	4.47**
F(df1, df2)	0.00 (1, 86)		2.84 (1, 92)		3.85 (1, 95)		1.51 (1, 91)		1.87 (1, 93)		3.08 (1, 64)		4.98 ^t (1, 97)		(4.77, 462.78)	(4.23, 412.99)
Middle-aged woman	45.9	45.0	65.3	53.4	69.9	63.3	68.3	62.6	74.1	66.3	73.8	52.6	64.8	59.3	6.89***	3.52**
F(df1, df2)	0.02 (1, 86)		2.80 (1, 92)		1.52 (1, 95)		1.12 (1, 91)		1.99 (1, 93)		5.35 ^t (1, 64)		5.04 ^t (1, 97)		(4.72, 457.839)	(4.55, 441.09)
Sex trade (%)																
Buy sex	18.3	12.9	44.3	20.1	47.7	24.3	43.2	29.9	49.6	25.1	59.5	26.2	41.4	23.8	9.50***	2.63*
F(df1, df2)	1.51 (1, 86)		13.12 ^{ttt} (1, 92)		18.70 ^{ttt} (1, 95)		5.66 ^t (1, 91)		11.28 ^{tt} (1, 93)		13.75 ^{ttt} (1, 64)		38.67 ^{ttt} (1, 97)		(4.34, 421.31)	(4.51, 437.50)
Sell sex	15.4	14.0	44.6	16.3	41.9	21.3	41.4	25.8	46.7	24.0	59.1	25.0	38.8	21.3	8.99***	1.82
F(df1, df2)	0.09 (1, 86)		17.58 ^{ttt} (1, 92)		12.46 ^{tt} (1, 95)		8.43 ^{tt} (1, 91)		9.99 ^{tt} (1, 93)		15.17 ^{ttt} (1, 64)		38.93 ^{ttt} (1, 97)		(4.61, 446.99)	(4.59, 445.61)
Homosexual partnership	11.9	28.2	27.6	28.5	25.8	34.6	25.9	28.3	27.1	34.2	16.0	32.0	22.7	31.1	3.04*	0.75
F(df1, df2)	10.32 ^{tt} (1, 86)		0.03 (1, 92)		3.54 (1, 95)		0.22 (1, 91)		1.46 (1, 93)		3.24 (1, 64)		15.09 ^{ttt} (1, 97)		(4.77, 462.92)	(4.40, 426.55)

Table 3 continued

Attitudes	Age group and gender												F(df1, df2)				
	15-19		20-24		25-34		35-44		45-54		55-59			Total			
	M	W	M	W	M	W	M	W	M	W	M	W		M	W		
Multiple sexual partnership	16.2	14.6	37.6	13.2	32.2	20.3	27.5	14.7	27.8	17.5	28.3	13.4	28.1	16.2	3.59** (4.77, 462.92)	0.95 (4.76, 461.76)	
F(df1, df2)	0.13 (1, 86)	21.82 ^{***} (1, 92)	5.28 ^t (1, 95)	7.23 ^{tt} (1, 91)	3.29 (1, 93)	3.59 (1, 64)	27.79 ^{***} (1, 97)	3.29 (1, 93)	3.29 (1, 93)	3.29 (1, 93)	3.59 (1, 64)	3.29 (1, 93)	27.79 ^{***} (1, 97)	3.29 (1, 93)	3.29 (1, 93)	3.29 (1, 93)	3.29 (1, 93)
Woman carrying condom	40.8	53.9	51.9	49.0	51.9	50.2	54.1	48.7	52.9	44.6	60.1	31.8	50.7	48.0	1.98 (4.82, 467.16)	1.36 (4.45, 431.99)	
F(df1, df2)	3.60 (1, 86)	0.16 (1, 92)	0.09 (1, 95)	0.84 (1, 91)	2.06 (1, 93)	11.26 ^{***} (1, 64)	0.98 (1, 97)	0.98 (1, 97)	0.98 (1, 97)	0.98 (1, 97)	0.98 (1, 97)	0.98 (1, 97)	0.98 (1, 97)	0.98 (1, 97)	0.98 (1, 97)	0.98 (1, 97)	

For all items, the response categories were "Others" ("Unacceptable" and "Neutral") and "Acceptable". All data presented in the table are percentages of those who responded "Acceptable" only
M men, W women

Significance is based on the adjusted F (a variant of the second-order Rao-Scott adjusted chi square statistic) and its degrees of freedom. Significance levels of tests across age groups within gender are represented by * $p < .05$, ** $p < .01$ and *** $p < .001$. Significance levels of tests between genders within age group are represented by ^t $p < .05$, ^{tt} $p < .01$, and ^{***} $p < .001$

(approximately 16 %) except men in the youngest age group where only 16.2 % found it acceptable.

Woman Carrying Condom

Although roughly 50 % of men and women viewed "woman carrying condom" acceptable, the trend was opposite between the two genders; as age increased, the proportion increased in men but decreased in women.

Multivariate Analysis

In Table 4, we present results of the multivariate logistic regression of sociodemographic characteristics in association with sexual behavior and attitudes. Results of the multivariate analyses were consistent with the results of the bivariate analyses in terms of the trends with regards to age and gender after adjusting for education, marital status, and residential area. Younger age was significantly associated with higher likelihood of having "first sex < 15," "lifetime multiple sexual partnership," "first sex with boy/girlfriend," "had casual sex within the past 12 months," "had sex with regular partners within the past 12 months," and "acceptance of premarital sex in adolescents." In regard to gender, being male was associated with greater odds of all other sexual behaviors and attitudes, with the exception of "first sex with spouse" and "acceptance of homosexual partnership" which were exclusively associated with being female. In addition, multivariate analysis results demonstrated that being never-married and/or higher education were associated with "lifetime multiple sexual partnership," "boy/girlfriend as first sexual partner," "bought sex in the last 12 months," "had sex with casual partner in the past 12 months," "acceptance of premarital sex of adolescents," "acceptance of sex trade," "acceptance of homosexuality," and "acceptance of multiple sexual partnership," "women carrying condom," with the last 5 attitudes showing a dose-dependent association with education level. Residential area was related to sexual behavior and attitudes only for "lifetime multiple sexual partnership" and "boy/girlfriend as first sexual partner" in urban dwellers and "spouse as first sexual partner" among rural residents.

Discussion

We report on the first comprehensive, cross-sectional study of age- and gender-segregated differential patterns of sexual behavior and attitudes among the general population of one rapidly urbanizing province in Thailand. We found that young Thai men and women were initiating sex at a substantially younger age and with a higher number of sexual partners as compared to older generations. The cohort differences in the type of first sexual partner also support the notion of a changing

Table 4 Multivariate logistic regression of sociodemographic characteristics in association to sexual behavior and attitudes

Outcome variables	Age		Gender	Education		Marital status	Residential area
	15–24 (ref: 45–59)	25–44 (ref: 45–59)	Male (ref: female)	Secondary (ref: Bprimary)	CUniversity (ref: Bprimary)	Never (ref: ever)	Urban (ref: rural)
	Adjusted odds ratio [95% confidence interval]						
	p value						
Sexual behavior							
Ever had sex ^a	0.09 [0.06, 0.14]	0.96 [0.63, 1.47]	2.13 [1.65, 2.76]	0.60 [0.38, 0.96]	0.44 [0.27, 0.72]	–	1.02 [0.79, 1.31]
	<.001	0.859	<.001	0.033	0.001		0.881
First sex <.15 ^a	7.83 [3.28, 18.69]	3.94 [1.64, 9.47]	3.63 [2.25, 5.86]	0.91 ^b [0.47, 1.77]		–	1.17 [0.77, 1.76]
	<.001	0.002	<.001	0.785			0.463
Lifetime MSP ^c	1.66 [1.11, 2.47]	2.16 [1.64, 2.85]	9.17 [7.17, 11.73]	1.46 [1.07, 2.00]	0.84 [0.60, 1.18]	1.68 [1.23, 1.87]	1.48 [1.17, 1.87]
	0.013	<.001	<.001	0.016	0.313	0.001	0.001
First sex: spouse ^c	0.20 [0.12, 0.33]	0.41 [0.30, 0.57]	0.05 [0.03, 0.06]	0.54 [0.38, 0.78]	0.68 [0.46, 1.02]	0.07 [0.04, 0.12]	0.66 [0.50, 0.87]
	<.001	<.001	<.001	0.001	0.060	<.001	0.004
First sex: Bf/Gf ^c	5.85 [3.94, 8.68]	2.93 [2.21, 3.88]	2.25 [1.79, 2.84]	1.68 [1.22, 2.33]	1.64 [1.16, 2.34]	4.05 [3.05, 5.38]	1.36 [1.08, 1.70]
	<.001	<.001	<.001	0.002	0.005	<.001	0.009
First sex: casual ^c	0.88 [0.50, 1.56]	1.23 [0.83, 1.84]	9.18 [5.78, 14.54]	1.22 [0.76, 1.95]	0.83 [0.49, 1.40]	0.82 [0.54, 1.23]	1.00 [0.73, 1.39]
	0.661	0.303	<.001	0.415	0.484	0.330	0.979
First sex: CSW ^d	0.15 ^e [0.09, 0.25]		–	0.73 [0.41, 1.30]	1.16 [0.63, 2.13]	0.62 [0.34, 1.13]	1.03 [0.67, 1.60]
	<.001			0.284	0.634	0.118	0.893
Bought sex past 12 months ^c	0.32 [0.13, 0.77]	1.13 [0.61, 2.09]	18.45 [6.66, 51.15]	2.65 [1.01, 6.93]	2.41 [0.89, 6.49]	2.31 [1.33, 3.99]	1.26 [0.79, 2.01]
	0.011	0.694	<.001	0.048	0.083	0.003	0.336
Had casual sex past 12 months ^c	1.95 [0.98, 3.89]	2.02 [1.10, 3.72]	6.47 [3.86, 10.85]	2.25 [1.08, 4.68]	1.67 [0.78, 3.60]	3.36 [2.15, 5.25]	1.40 [0.97, 2.01]
	0.058	0.023	<.001	0.030	0.188	<.001	0.070
Had sex with regular partner past 12 months ^c	2.36 [1.62, 3.45]	3.23 [2.44, 4.29]	1.36 [1.07, 1.72]	1.17 [0.86, 1.60]	1.35 [0.96, 1.91]	0.36 [0.26, 0.49]	1.13 [0.90, 1.42]
	<.001	<.001	0.013	0.319	0.086	<.001	0.308
Sexual attitudes							
Premarital sex in adolescent	1.16 [0.87, 1.55]	1.30 [1.04, 1.63]	1.33 [1.11, 1.58]	1.33 [1.03, 1.72]	1.93 [1.46, 2.54]	1.45 [1.16, 1.80]	0.87 [0.73, 1.04]
	0.323	0.020	0.002	0.028	<.001	0.001	0.123
Premarital sex in middle-aged	0.47 [0.35, 0.64]	0.85 [0.66, 1.08]	1.27 [1.06, 1.54]	0.80 [0.61, 1.06]	1.14 [0.84, 1.54]	1.10 [0.86, 1.39]	1.00 [0.83, 1.20]
	<.001	0.186	0.012	0.115	0.397	0.453	0.959
Sex trade	0.42 [0.31, 0.58]	0.82 [0.65, 1.03]	2.42 [2.00, 2.92]	1.34 [1.01, 1.77]	1.72 [1.28, 2.31]	1.26 [0.99, 1.59]	1.00 [0.83, 1.20]
	<.001	0.088	<.001	0.041	<.001	0.057	0.964
Homosexual partnership	0.57 [0.41, 0.79]	0.87 [0.68, 1.11]	0.56 [0.46, 0.68]	1.18 [0.89, 1.58]	1.54 [1.14, 2.10]	1.49 [0.17, 1.90]	0.90 [0.74, 1.09]
	0.001	0.275	<.001	0.256	0.006	0.001	0.266
Multiple sexual partnership	0.69 [0.49, 0.98]	0.91 [0.70, 1.19]	1.88 [1.52, 2.32]	1.21 [0.88, 1.68]	1.64 [1.16, 2.30]	1.39 [1.07, 1.81]	0.94 [0.76, 1.16]
	0.039	0.491	<.001	0.244	0.005	0.013	0.584
Woman carrying condom	0.86 [0.64, 1.14]	1.09 [0.87, 1.36]	1.03 [0.87, 1.23]	1.33 [1.04, 1.72]	1.78 [1.35, 2.34]	1.02 [0.82, 1.27]	1.04 [0.88, 1.24]
	0.294	0.449	0.714	0.025	<.001	0.861	0.652

Table 4 continued

Outcome variables	Age		Gender	Education		Marital status	Residential area
	15–24 (ref: 45–59)	25–44 (ref: 45–59)		Secondary (ref: Bprimary)	CUniversity (ref: Bprimary)		
Men only ^f	0.62 [0.40, 0.96]	0.87 [0.62, 1.23]	–	1.21 [0.82, 1.79]	1.91 [1.25, 2.92]	1.11 [0.80, 1.54]	1.10 [0.86, 1.42]
	0.031	0.439		0.340	0.003	0.547	0.458
Women only ^g	1.11 [0.76, 1.64]	1.29 [0.96, 1.73]	–	1.41 [1.01, 1.96]	1.59 [1.11, 2.29]	1.04 [0.77, 1.40]	1.00 [0.78, 1.27]
	0.582	0.091		0.043	0.012	0.806	0.996

Analysis was not carried out under complex sample module and does not include weight

Ref reference category, MSP multiple sexual partner, Bf boyfriend, Gf girlfriend, CSW commercial sex worker

^a All participants (n = 2,138)

^b Two categories ("Bprimary education" and "Others")

^c Sexually experienced participants only (n = 1,715). Sample size varies slightly across variables due to item non-response

^d Sexually experienced men only (n = 846)

^e Two categories ("15–44" and "45–59")

^f All men (n = 1,010)

^g All women (n = 1,128)

context of Thai sexual norms—a shift from CSWs to girlfriends in men and from spouses to boyfriends in women.

The changes were especially profound in young women as reflected by the prominent difference in the proportion of participants who had sexual onset before the age of 15 including a higher cumulative number of lifetime sexual partners. This is in contrast to the reported one sexual partner in women in their 40s and 50s. We also found significant changes in sexual attitudes as more young women approved of premarital sex in adolescents and of women carrying condoms in their bags. Altogether, the gender gap in sexual norms in Thai society seems to be diminishing among younger generations.

Multivariate analyses, adjusted by education level, marital status, and residential area, confirmed these findings and further demonstrated that these sexual behaviors and attitudes were associated with higher education, being never-married, and, in part, with urban residence, suggesting that urbanization and contemporary social change may be contributing to the change in Thai sexual norm.

Our findings were consistent with existing evidence in Thailand which demonstrates secular changes in sexual behavior and that the changes are particularly more pronounced in women. In Thailand, the National HIV-related Behavior Sentinel Surveillance has been conducted annually since 1995 by the Bureau of Epidemiology, Ministry of Public Health, among various subpopulations such as military recruits, women attending antenatal care clinics, men attending STIs clinics, etc. and later expanded to include high school and vocational school students in 1996. It has been longitudinally demonstrated that the sexual experience rate of high school students (Grade 11, median age 16–17 years old) is on a continuous rise over the past decade: from 9.8 % in 1996 to 28.0 % in 2011 in men and from 3.5 to 16.4 % in women (Bureau of Epidemiology, 2011).

The changing patterns of sexual behavior in younger generations in our study were consistent with previous population-based sex surveys from industrialized countries conducted in the 1990s. Surveys from Australia (Boyle, Dunne, Purdie, Najman, & Cook, 2003), Britain (Johnson et al., 1994), France (ACSF Investigators, 1992), Japan (Ono-Kihara, 2011), New Zealand (Davis & Lay-Yee, 1999), Norway (Sundet, Magnus, Kvaalem, Samuelsen, & Bakketeig, 1992), Sweden (Giesecke, Scialia-Tomba, Göthberg, & Tüll, 1992), and the United States (Laumann, Gagnon, Michael, & Michaels, 1994; Turner et al., 1995) have confirmed progressive declines in age at first sexual intercourse together with a narrowing gap of gender differences between men and women.

To our knowledge, our study was the first population-based survey to document such changes in Thailand. Such changes in sexual behavior and attitudes are a major public health concern where STIs and unintended pregnancies have been rapidly increasing among adolescents over the past 15 years (Bureau of Epidemiology, 2013; Ministry of Social Development and Human Security, 2010), where there is still an endemic of HIV/

AIDS in various subgroups (Armed Forces Research Institute of Medical Sciences, 2011; Bureau of Epidemiology, 2012; UNAIDS, 2012) and where a new wave of HIV is predicted to emerge through 2025 via both heterosexual and homosexual transmission (Commission on AIDS in Asia, 2008). It is well established that younger age of sexual onset is a risk factor for HIV infection (Gregson et al., 2002; Pettifor, 2004; Sarkar et al., 2006; Wand & Ramjee, 2012), other STIs (Celentano et al., 2008; Duncan et al., 1990; Gindi, Erbelding, & Page, 2010; Kaestle, Halpern, Miller, & Ford, 2005), and unintended pregnancy (Ma et al., 2009; Wellings et al., 2001). Furthermore, multiple sexual partnerships are an important determinant of transmission of HIV/STIs (Koumans et al., 2001; Morris & Kretzschmar, 1997; Potterat et al., 1999; Terrault, 2002; Winer et al., 2003). Many nationwide population-based surveys have also demonstrated that such changes in sexual norms are associated with rising incidence of STIs in the United Kingdom (Wellings et al., 2001), unintended pregnancies in the United States (Hofferth, Kahn, & Baldwin, 1987), and induced abortions among adolescents in Japan (Ono-Kihara, 2011).

Concomitant with the changes, however, our data also revealed that the traditional “double standards” of sexual norms is still evident in all age groups: men initiate sexual activity earlier, have more lenient attitudes towards the sex trade, have multiple sexual partnerships, and more commonly engage in casual and commercial sex than women. With regards to attitudes, the overall rate of acceptance of premarital sex in male adolescents was higher than premarital sex in female adolescents and similarly, a higher tolerance of premarital sex in middle-aged men than in middle-aged women. Such double standards in sexual norms in Thailand may also have significant public health implications. The community-wide attitudes toward the sexual activities of young unmarried women may lead them to feel stigmatized and discouraged to seek contraceptives, sexual and reproductive health information, and services (Tangmunkongvorakul et al., 2005; Techasrivichien, 2013) and hence place them at increased risk for adverse sexual health outcomes.

It is true that by virtue of Thailand’s “success” in controlling the HIV outbreak in the 1990s among high risk groups (Ainsworth, Beyrer, & Soucat, 2003; Low-Beer & Sarkar, 2010; Rojanapithayakorn & Hanenberg, 1996), sexually active men and women in Thailand today would likely be by far less at risk than they were several decades ago. Nevertheless, it has been indicated that the “success” in the control of HIV infection through commercial sex does not have much impact on the slow but steady transmission from infected male clients of CSWs to their regular sex partners and the transmission through casual sexual relationships (UNAIDS, 2009; World Health Organization, 2004). The ineffectiveness of existing programs are likely evident by the rising STIs and unintended pregnancies among adolescents since the beginning of the century (Bureau of Epidemiology, 2013; Ministry of Social Development and Human Security, 2010). This is the background of the projections

Commission on AIDS in Asia (2008) that, by the year 2025, Asia will face an unprecedented wave of HIV epidemic through sexual transmission. Being among the countries with the highest HIV prevalence in Asia (UNAIDS, 2013), revitalization of existing prevention programs and development of culturally appropriate interventions to prevent adverse sexual health outcomes is, thus, of vital importance and urgently needed in Thailand.

Our research may have implications for other Asian countries undergoing a similar process of urbanization and globalization and that share similar cultural backgrounds and values. Considering emerging attention on premarital sex of young people in many Asian societies (Adhikari & Tamang, 2009; Gipson, Gultiano, Avila, & Hindin, 2012; Jaya & Hindin, 2009; Le Linh, 2009; Tang et al., 2012; Wong, 2012), it is likely that the sexual norms of young people, particularly of young women, is now rapidly changing in many other Asian countries as well. As the process of urbanization is still continuing in Thailand (National Statistical Office, 2011), our study could serve as a baseline to monitor further changes of sexual norms over time. With the aging of the cohorts of our study and the emerging of new young cohorts, it is likely that Thai sexual norms may be virtually transformed in the future.

Strengths and Limitations

This study was designed to maximize methodological validity. Sampling was by means of multistage probability sampling at a provincial scale with extensive mapping and efforts were made to visit multiple times if participants were not at home. The survey was conducted using a self-administered questionnaire through an internet-enabled tablet to minimize interviewer bias and socially desirable answers on the sensitive issue of sexual behavior. These efforts yielded high overall response rates of 85.5 %. In spite of these efforts, however, bias could have been introduced if nonresponse (15 %) occurred in a nonrandom fashion, being biased to sexually active or inactive subpopulation. Generalization of the results of this study should be done with caution since this study was conducted only in one province of Thailand. Finally, recall biases, especially on the cumulative number of lifetime partners, particularly among older generations, should also be noted.

Conclusion

We found strong evidence for a decline in reported age of sexual initiation, a higher number of sexual partners, a shift in the type of the first sexual partner, and a greater rate of acceptance of adolescent premarital sex among younger generations. The study highlights profound changes among young Thai women. In contrast to the significant gender gap in older generations, sexual profiles of young Thai women have evolved to resemble

those of young men with attitudes gradually converging to similar sexual standards. Our study underscores gender- and generation-differences in sexual norms, which in part, may explain the recent transformations of Thai sexual norms. While also taking into consideration the persistence of a sexual “double standard” between men and women, it is vital to continue monitoring such changes, in light of the potential impact they may have on the course of the HIV/STIs epidemic and unintended pregnancies.

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