表 8. 東アジアにおける感染経路別 HIV/AIDS 報告数（3）

香港	男性	異性間の性的接触	1	0	0	2	6	9	11	26	27	37	59	56	70	84	93	88	78	83	99	83	73	75	84	77	92	70	61	64	67	72
HIV		同性間の性的接触	1	10	6	12	12	15	8	18	27	20	22	26	20	33	16	34	22	37	48	46	62	87	110	160	139	165	146	177	243	278
		両性間の性的接触	0	1	2	7	2	6	5	8	2	2	4	4	3	10	6	10	7	7	9	5	6	11	15	19	18	9	23	18	17	22
		静注薬物濫用	0	1	0	0	1	2	0	0	2	1	2	2	1	2	1	6	10	10	10	11	22	31	56	41	40	15	15	10	5	7
		血液	5	32	8	7	2	2	5	0	1	1	1	0	0	0	0	1	0	0	0	0	0	3	0	0	2	1	0	1	0	0
		母子感染	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	3	2	2	1	0	0	2	1	1	0	1	1	0	0	0
		不明	0	2	2	4	4	2	4	5	4	8	1	7	14	17	26	26	20	19	34	30	42	46	38	44	57	48	35	74	67	65
		合計	7	46	18	32	27	36	33	57	63	69	90	97	108	146	142	168	139	158	201	175	205	255	304	342	348	309	281	344	399	444
	女性	異性間の性的接触	0	0	0	1	0	2	1	3	5	10	14	25	24	33	42	39	37	44	47	33	39	42	46	35	52	46	59	53	66	75
		同性間の性的接触	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		両性間の性的接触	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		静注薬物濫用	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1	3	0	2	3	2	0	0	4	2	0
		血液	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	2	1	0	0	1	1	1
		母子感染	0	0	0	0	0	0	0	0	0	0	0	1	0	2	1	0	0	0	0	0	0	1	0	0	0	2	0	0	1	0
		不明	0	0	0	0	0	0	0	0	2	0	0	0	1	1	3	4	7	10	12	20	21	15	20	32	32	39	47	36	44	39
		合計	0	0	2	1	1	2	1	3	8	10	14	25	26	35	47	45	44	55	59	54	63	58	69	72	87	87	108	94	114	115
	合計	異性間の性的接触	1	0	0	3	6	11	12	29	32	47	73	81	94	117	135	127	115	127	146	116	112	117	130	112	144	116	120	117	133	147
		同性間の性的接触	1	10	6	12	12	15	8	18	27	20	22	26	20	33	16	34	22	37	48	46	62	87	110	160	139	165	146	177	243	278
		両性間の性的接触	0	1	2	7	2	6	5	8	2	2	4	4	3	10	6	10	7	7	9	5	6	11	15	19	18	9	23	18	17	22
		静注薬物濫用	0	1	0	0	2	2	0	0	3	1	2	2	1	2	1	6	10	11	10	12	25	31	58	44	42	15	15	14	7	7
		血液	5	32	10	7	2	2	5	0	1	1	1	0	0	1	0	2	0	0	0	0	0	4	0	2	3	1	0	2	1	1
		母子感染	0	0	0	0	0	0	0	0	0	0	1	2	1	0	2	4	2	2	1	0	0	2	2	1	0	3	1	0	1	0
		不明	0	2	2	4	4	2	4	5	6	8	1	7	15	18	29	30	27	29	46	50	63	61	58	76	89	87	82	110	111	104
		合計	7	46	20	33	28	38	34	60	71	79	104	122	134	181	189	213	183	213	280	229	268	313	373	414	435	396	389	438	513	559
香港	男性	異性間の性的接触	0	1	0	0	0	3	3	2	5	7	13	24	50	33	41	38	47	37	27	34	30	28	19	32	38	25	24	16	23	18
AIDS		同性間の性的接触	0	1	0	3	4	8	2	6	8	7	13	9	6	10	6	8	1	5	8	7	8	13	21	20	25	28	27	32	34	36
		両性間の性的接触	0	1	0	0	1	3	3	2	1	1	4	3	1	3	1	1	1	2	2	0	0	3	3	1	3	3	5	4	4	5
		静注薬物濫用	0	0	0	0	0	1	0	0	0	0	0	1	1	1	0	1	2	1	1	0	3	1	11	9	9	2	3	3	2	4
		血液	0	0	0	0	1	2	3	3	0	0	3	0	2	1	1	2	1	0	0	1	0	0	0	0	1	0	0	0	0	0
		母子感染	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	1	0	0	0
		不明	0	0	0	2	1	0	2	1	0	0	0	0	5	5	4	4	4	2	3	2	3	6	7	6	5	6	5	7	5	7
		合計	0	3	0	5	7	17	13	14	14	15	34	38	65	53	53	55	57	48	41	44	44	51	61	68	81	64	65	62	68	70
	女性	異性間の性的接触	0	0	0	1	0	0	0	0	0	3	3	7	5	11	9	6	9	12	11	12	5	10	11	8	14	10	12	13	16	13
		同性間の性的接触	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		両性間の性的接触	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		静注薬物濫用	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
		血液	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0
		母子感染	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
		不明	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	2	1	2	0	1	2	5	2	1
		合計	0	0	0	1	0	0	0	0	0	4	3	7	5	11	10	6	10	12	12	12	5	13	12	11	15	12	14	20	18	14
	合計	異性間の性的接触	0	1	0	1	0	3	3	2	5	10	16	31	55	44	50	44	56	49	38	46	35	38	30	40	52	35	36	29	39	31
		同性間の性的接触	0	1	0	3	4	8	2	6	8	7	13	9	6	10	6	8	1	5	8	7	8	13	21	20	25	28	27	32	34	36
		両性間の性的接触	0	1	0	0	1	3	3	2	1	1	4	3	1	3	1	1	1	2	2	0	0	3	3	1	3	3	5	4	4	5
		静注薬物濫用	0	0	0	0	0	1	0	0	0	1	0	1	1	1	0	1	2	1	1	0	3	1	11	9	9	2	3	5	2	4
		血液	0	0	0	0	1	2	3	3	0	0	3	0	2	1	1	2	1	0	0	1	0	1	0	1	2	0	0	0	0	0
		母子感染	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	1	1	0	0	0	0	0	0	0	1	1	0	0	0
		不明	0	0	0	2	1	0	2	1	0	0	0	0	5	5	4	4	5	2	4	2	3	8	8	8	5	7	7	12	7	8
		合計	0	3	0	6	7	17	13	14	14	19	37	45	70	64	63	61	67	60	53	56	49	64	73	79	96	76	79	82	86	84
韓国	男性	異性間の性的接触		1		1	13	26	43	28	34	43	50	63	59	58	58	84	108	153	174	210	235	289	311	296	234	204	315	263	504	561
HIV/AIDS		同性間の性的接触					2	7	4	6	28	13	23	20	21	41	34	51	60	95	147	231	254	277	278	171	191	169	223	218		
		静注薬物濫用									1								1										1	0	0	0
		その他				3	2	2	1	10	14	6	6	5	13	10	19	25	25	44	42	61	68	74	99	234	318	340	184	346	303	385
		合計		1	0	4	17	35	48	42	77	62	79	88	93	107	111	160	194	292	363	502	557	640	688	701	743	713	723	827	808	946
	女性	異性間の性的接触		0	3	5	5	1	4	3	4	7	11	17	11	16	15	21	22	35	32	28	42	33	53	27	34	25	39	41	37	38
		静注薬物濫用																											0	0	0	0
		その他						1		1				2	1	1	3	5	3		3	4	11	7	9	16	20	33	11	20	23	29
		合計		0	3	5	5	2	4	4	4	7	11	19	12	17	18	26	25	35	35	32	53	40	62	43	54	58	50	61	60	67
	合計	異性間の性的接触		1	3	6	18	27	47	29	38	50	61	80	70	72	73	105	130	188	206	238	277	322	364	323	268	229	354	304	541	599
		同性間の性的接触					2	7	4	6	28	13	23	20	21	41	34	51	60	95	147	231	254	277	278	171	191	169	223	218		
		静注薬物濫用		0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0
		その他		0	0	3	2	3	1	11	14	6	6	7	14	11	22	30	28	44	45	65	79	81	108	250	338	373	195	366	326	414
		合計		1	3	9	22	37	52	46	81	69	90	107	105	124	129	186	219	327	398	534	610	680	750	744	797	771	773	888	868	1013

表 9. 東アジアにおける年齢階級別 HIV/AIDS 報告数

表 10. 東アジアにおける性感染症報告数

	Diseases	Sex	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
中国	Syphilis (Prim and Sec) 梅毒	Male											40,515						51,494	60,338	71,138	78,343				
		Female											39,666						48,259	57,648	67,529	77,582				
		Total		1,892	1,997	2,016	4,591	11,336	20,765	33,673	53,858	80,406	80,181	77,245			66,478	74,017	99,753	117,986	138,667	155,925	177,387	180,460		
	Chlamidya 衣原体	Male																								
		Female																								
		Total																								
	Gonorrhea 淋病	Male															177,053	131183	127,151	118,167		96,601	84,295			
		Female															51,241	38532	34,892	30,793		25,452	21,249			
		Total		111,473	130,655	161,638	193,632	204,809	202,196	224,865	299,473	340,960	285,661	234,561			228,294	169,715	162,403	148,960	134,303	122,053	105,544	102,070		
	Chancroid 軟下疳	Male															438	342								
		Female															107	121								
		Total															545	463								
	Lymphogranuloma Venereum 性病淋巴肉芽肿	Male															250	195								
		Female															143	194								
		Total															393	389								
台湾	Syphilis (Prim and Sec)	Male	0	0	0	0	0	0	1	1	2	21	2,382	2,588	2,648	2,615	3,453	3,516	3,957	4,078	4,630	4,609	4,525	4,584	4,369	4,929
		Female	0	0	0	0	0	0	0	1	2	4	1,448	1,586	1,555	1,379	1,757	1,786	1,851	1,729	1,895	2,060	1,493	1,474	1,264	1,193
		Total	0	0	0	0	0	0	1	2	4	25	3,830	4,174	4,203	3,994	5,210	5,302	5,808	5,807	6,525	6,669	6,018	6,058	5,633	6,122
	Chlamidya	Male																								
		Female																								
		Total																								
	Gonorrhea	Male	1	2	2	0	0	0	0	0	0	0	291	391	737	1,487	1,814	1,375	1,297	1,298	1,492	1,915	2,045	1,787	1,834	1,997
		Female	1	1	2	2	0	0	0	0	0	0	69	48	94	153	166	140	140	146	129	222	173	139	110	149
		Total	2	3	4	2	0	0	0	0	0	0	360	439	831	1,640	1,980	1,515	1,437	1,444	1,621	2,137	2,218	1,926	1,944	2,146
香港	Syphilis (Primary)	Male							145	221	281	284	259	213	169	114	121	66	47	45	43	60	47	52	46	42
		Female							6	7	12	5	12	8	5	1	3	6	1	45	2	3	3	0	0	0
		Total							151	228	293	289	271	221	174	115	124	72	48	50	45	63	50	52	46	42
	Syphilis (Secondary)	Male							33	48	51	51	55	45	56	56	34	34	38	50	48	62	44	42	47	87
		Female							11	18	18	24	32	15	11	12	15	2	4	8	8	7	10	9	11	2
		Total							44	66	69	75	87	60	67	68	49	36	42	58	56	69	54	51	58	89
	Gonorrhoea	Male							2021	2099	2327	2778	3040	2856	2719	2747	2128	1535	1413	1277	1254	1264	849	1044	1084	1067
		Female							321	313	448	426	478	550	568	389	364	213	182	204	169	137	119	135	138	144
		Total							2342	2412	2775	3204	3518	3406	3287	3136	2492	1748	1595	1481	1423	1401	968	1179	1222	1211
	NGU/NSGI*	Male							5899	6262	7247	7903	7490	6659	7084	5897	5281	4542	4540	3782	3766	3922	3350	3297	3501	3843
		Female							3464	3492	5549	6882	6686	7025	7066	5743	5839	4756	3774	2979	2752	3006	2988	2393	2501	2608
		Total							9363	9754	12796	14785	14176	13684	14150	11640	11120	9298	8314	6761	6518	6928	6338	5690	6002	6451
	Genital Wart	Male							2513	2513	2909	3064	2681	2515	2485	2146	2554	2069	1901	1793	1655	1552	1266	1174	1327	1317
		Female							655	611	732	825	804	801	760	600	695	660	592	574	621	588	505	503	556	585
		Total							3168	3124	3641	3889	3485	3316	3245	2746	3249	2729	2493	2367	2276	2140	1771	1677	1883	1902
	Herpes Genitalis	Male							888	986	1145	1190	1096	1221	1170	923	877	791	716	610	554	415	410	410	426	609
		Female							109	127	198	208	229	251	262	186	208	189	162	156	161	188	184	173	232	279
		Total							997	1113	1343	1398	1325	1472	1432	1109	1085	980	878	766	715	603	594	583	658	888
韓国	Syphilis (Prim and Sec)	Male												118	81	325	410	293	498	585						
		Female												134	53	257	397	381	681	830						
		Total												252	134	582	807	674	1,179	1,415	1,786	1,681	1,402	1,167	872	859
	Chlamidya	Male												31	32	37	86	43	57	128						
		Female												323	2,028	4,011	5,884	4,202	2,921	3,068						
		Total												354	2,060	4,048	5,970	4,245	2,978	3,196	5,598	6,138	4,914	3,481	3,182	2,861
	Gonorrhea	Male												14,254	15,529	10,162	7,066	4,403	3,468	2,578						
		Female												4,138	5,950	5,128	3,779	1,732	751	537						
		Total												18,392	21,479	15,290	10,845	6,135	4,219	3,115	797	612	633	472	327	504
	Chancroid	Male												5	1	0	0	0	0	0						
		Female												0	0	1	0	0	0	0						
		Total												5	1	1	0	0	0	0	15	24	3	2	19	2
	Herpes simplex	Male																								
		Female																								
		Total																			1,445	1,328	893	462	533	0

*NGU: Non-gonococcal urethritis, NSGI: Non-specific genital infection

厚生労働科学研究費補助金（エイズ対策政策研究事業）
高リスク層の HIV 感染監視と予防啓発及び内外の HIV 関連疫学動向の
モニタリングに関する研究（平成 24-26 年総合研究報告書）

Changing patterns of HIV epidemic in 30 years in East Asia

S. Pilar Suguimoto MD, PhD, Teeranee Techasrivichien MSc, Patou Masika Musumari MD, Christina El-saaidi BDS MPH, Bhekumusa Wellington Lukhele MPH, Masako Ono-Kihara PhD, and Masahiro Kihara MD, PhD

Department of Global Health and Socio-epidemiology, Kyoto University School of Public Health

Abstract

The HIV epidemic in East Asia started relatively late compared to the rest of the world. All countries or areas, except for North Korea, had reported HIV and AIDS cases, with China being the major contributor to the epidemic. Though initially driven by injecting drug use in China, East Asia did not experience an explosive spread. Strong commitment in China and early harm reduction programs in Taiwan managed to control the epidemic among injecting drug users. However, following a global trend, sexual contact has become a major route of infection across the region. While much progress has been achieved in this region, with the epidemic among other key populations relatively stable, the emerging epidemic through sex between men is a growing concern, urging to address issues of discrimination and stigma towards homosexuality, and to strengthen the strategies to reach and care for this population.

Keywords: (up to 25) East Asia, Japan, China, Taiwan, Hong Kong, South Korea, Mongolia, HIV, AIDS, HIV testing, MSM, epidemiology

Introduction

Despite the tremendous progress in the global response to the HIV epidemic, we have not yet been able to fully control the spread of HIV infection [1]. Since the start of the epidemic over 30 years ago, around 75 million have become infected with HIV and nearly 36 million have died of AIDS. The HIV epidemic has become one of the greatest pandemics in modern times with disastrous socioeconomic and demographic consequences [2]. The unprecedented scale of multisectoral approach and coordinated global efforts to respond to this epidemic can serve as a model of response to other global health threats such as chronic diseases [2].

HIV was introduced much later in East Asia than in the rest of the world, but the pattern of spread differed from that described in other regions [3]. According to the latest UNAIDS estimates, there were 35.3 million people worldwide living with HIV infection in 2012, of whom 880,000 resided in East Asia [1]. Unlike the global downward trend, the number of

estimated newly infections among all ages and among children increased in 19% and 50%, respectively, in East Asia since 2001. Similarly, the estimated number of AIDS-related deaths increased from 18,000 in 2001 to 41,000 in 2012. The estimated HIV prevalence in East Asia is still low (0.1%) compared to other regions, notably sub-Saharan Africa (4.7%), North America (0.5%), or neighboring countries in South and Southeast Asia (0.3%) [1]. But given the large population in China (1.3 billion, 2012) [4], even low prevalence translates into large numbers of people affected. Being China the hardest hit in this region, not surprisingly the HIV epidemic of other countries or areas in East Asia is usually overlooked when referring to Asia at large. Therefore, we would like to describe the trends or patterns of the HIV epidemics over the last 30 years in Japan, People's Republic of China (China), Taiwan, Hong Kong, Republic of Korea (South Korea), and Mongolia.

China

China is by far the largest country in East Asia and most populous in the world [4]. Although the national estimated prevalence of HIV infection remains low at 0.058% [5], China alone accounts for 89% of the estimated people living with HIV (PLHIV) in East Asia [1]. It was estimated that by the end of 2011 there were 780,000 PLHIV, of whom 154,000 were living with AIDS. Although, the annual incidence of HIV infection has remained stable at a low level in recent years, the patterns of transmission have evolved over time [5, 6]. HIV prevalence varies greatly among different sub-populations and shows clear regional disparities [6]; 6 out of 31 provinces reported 75.8% of the cumulative national total of HIV/AIDS cases [5].

China's HIV epidemic began in rural areas and then spread to urban areas. The first case of AIDS was reported in 1985 in a tourist from the United States [7]. The following years other isolated cases were reported in foreigners and Chinese traveling overseas and hemophiliac patients infected through imported contaminated blood products [8]. The first outbreak of HIV infection, however, was reported in 1989 among IDUs in Yunnan Province close to the so-called "Golden Triangle", an opium producing area of South East Asia. From there, HIV spread steadily along major drug trafficking routes and from injecting drug users (IDUs) into the general population through sexual contact [9]. As it rapidly spread among IDUs, HIV also spread among female sex workers (FSWs). Subsequent sexual transmission to their male clients and other sexual partners led to further spread of HIV.

Around the mid-1990s a second major outbreak of HIV infection occurred among commercial blood/plasma donors in rural communities in the east-central provinces due to unhygienic practices [10, 11]. As soon as the problem became apparent in the early 2000s, the Chinese government took strong action to prevent further spread closing blood collection stations, issuing new regulations, conducting mass HIV screenings, and providing free treatment (National Free Antiretroviral Treatment Program) [12]. There is no accurate data reported on the number of people infected, but in 2005 the Ministry of Health and UNAIDS/WHO estimated it to be 55,000 [13, 14]. Former commercial blood/plasma donors were primarily poor farmers with almost no IDU or commercial sex work in their communities. A recent study revealed that the HIV epidemic in former plasma donors was not widespread but rather centered in Henan Province and surrounded provinces [11]. By 2004, 43% of the cumulative reported HIV cases were IDUs and 26.8% former commercial plasma donors [15].

As the HIV epidemic among IDUs has fallen(except for the southwest region), HIV incidence

has stabilized since 2005 [6] probably because of significant progress towards implementing and enhancing harm-reduction programs countrywide [6, 16]. The proportion of newly reported HIV cases who acquired the infection through IDU has decreased from 34.1% in 2006 to 16.9% in 2011 (Table 2) [17]. In contrast, the proportion of new HIV cases resulting from sexual transmission increased from 33.1% in 2006 to 76.3% in 2011, in which cases of MSM increased from 2.5% to 13.7% [17]. The HIV epidemic is rapidly expanding among MSM (Figure 1). A national epidemiological survey including over 47,000 MSM was conducted between 2008 and 2009 in 61 major cities of China [18]. This survey reported an overall HIV prevalence of 4.9%, with the highest HIV prevalence of 13.2% in the southwest region. More recent estimates suggest that HIV prevalence among MSM has reached 6.3% in 2012, up from 5.7% in 2010 and 2% in 2007 [17, 19]. HIV incidence among MSM has tripled from 0.39 in 2000 to 0.98 per 100 person-years in 2010 nationwide, especially rapidly in large cities such as Shanghai, Beijing, Tianjin, Chongqing and Chengdu [6]. In addition, previous studies have reported high prevalence of syphilis among MSM, ranging from 9.5% to 17.5% [18, 20, 21], inconsistent condom use with male partners, multiple sexual partnerships including bisexual behaviors, low testing rates, and prevalent stigma and discrimination [18, 20, 22-24]. These data suggest the increasing potential of HIV infection spreading into the broader population [6].

Despite increasing heterosexual HIV transmission in China, the national HIV prevalence among FSWs has decreased from 0.46% in 2000 to 0.26% in 2011 [6, 19], remaining low except for southwest China where it was 1.57% in 2010 [6]. Similarly, HIV prevalence among sexually transmitted infection (STI) clinic attendees and pregnant women have been maintained at a low level [5]. Recent studies suggest that non-commercial heterosexual contact in the general population may play an important role [25, 26]. The prevalence of multiple sexual partnerships among adult women increased from 8.1% in 2000 to 29.6% in 2006 [26]. Other factors that may contribute to further expansion are the high prevalence of syphilis among different populations, characteristics of commercial sex work (eg. migrants, highly mobile, engaged for short time), and low condom use [27, 28]. Moreover, in provinces with high HIV prevalence among IDUs HIV prevalence is also high among FSWs and MSM, suggesting interactions between these groups [6].

Since the beginning of the 21st century China has taken bold steps to control the HIV epidemic and has made great progress [29]. However, many challenges still remain particularly addressing the needs of Chinese MSM [6, 29, 30].

Taiwan

The first AIDS case in Taiwan was identified in 1984 in an American in transit [31]. In the 1980s, similar to what happened in Japan and Hong Kong but in a smaller scale, at least 53 Taiwanese hemophiliacs were infected with HIV through contaminated blood products from the United States, 37 of them had died [31-34]. The government banned the use of unheated blood products in 1985 and no more HIV cases among hemophiliacs have been reported since 1997 [35]. By 2012, a total of 25,081 people had been reported as infected with HIV (24,239 Taiwanese and 842 foreigners), of whom 9,828 had developed AIDS (9,725 Taiwanese and 103 foreigners) (Table 1) [36]. Of Taiwanese nationals infected with HIV in 2012, male-to-female ratio was 30:1 [37]. Despite international growing advocacy to remove "HIV-related restrictions on entry, stay and residency" for PLHIV, Taiwan still keeps policy to deport foreigners on the grounds of HIV status [38].

The HIV epidemic in Taiwan is concentrated in high-risk populations. HIV prevalence among drug users was estimated to be 6.9%; much higher among IDUs compared to non-IDUs (25.5% vs. 0.5%) [39]. Among MSM, HIV prevalence varies between 8.1%-10.7% [40, 41]. However, the predominant mode of HIV transmission has changed over time (Figure 1). Until 2003, sexual transmission accounted for the largest proportion of new infections, predominantly sex between men which accounted for 61.5% that year [35]. In the following year the epidemic started to increase exponentially with the major route of infection shifting from unprotected sex to sharing needles and solvents to dilute heroin [42]. In 2005, the number of new HIV infections peaked at 3,380, a 122% increase over the previous year [37]. The total number of HIV cases attributable to IDU grew from 173 (3% of all cases) until 2003 to 3215 (32%) by 2005, a 19-fold increase in two years. Molecular epidemiological studies revealed that the HIV strain responsible for this outbreak may have originated in Yunnan Province, China [43, 44]. In response, the government took swift measures in 2005, which included harm-reduction programs such as needle and syringe exchange program (NSEP) and substitution treatment. After the introduction of these programs, all newly reported cases attributable to IDU fell from a high of 72% in 2005 to only 3.6% in 2012 [37]. Even though the HIV epidemic among IDUs is largely controlled, a survey in 2008 found that only 21% of IDUs in methadone maintenance treatment (MMT) programs were using condoms always/frequently in the last 6 months and almost all (93%) were infected with hepatitis C virus (HCV) [45]. In Taiwan, co-infection of HIV/HCV among IDUs has received increasing attention. The prevalence of HCV infection among HIV-infected IDUs increased from 65.5% before 2002 to 98.6% in 2006 [46]. A multicenter cohort study in the Asia Pacific region revealed that patients co-infected with HIV/HBV or HIV/HCV had significantly worse survival rates compared to HIV-infected patients [47]. Thus, the importance of preventing HCV infection among IDU population cannot be underestimated in harm reduction programs.

Since 2008, the epidemic took a turn and the spread of HIV among MSM has re-emerged as a major threat. The proportion of new HIV cases attributed to sex between men increased from 23.3% in 2006, 59.3% in 2008 to 77.2% in 2012 [35]. Bathhouses are reported as the most common venue for unprotected sex [48]. HIV incidence among MSM in gay bathhouses increased from 7.8% in 2004 to 15% in 2007 [40]. Over the same period, the prevalence of active syphilis among this population remained high but stable, from 31.8% to 23.0%. Of concern is that one fourth of attendees reported UAS at the last visit to the bathhouse. A recent online survey revealed that 72.4% of MSM used the Internet as a main way to seek sexual partners, of these, 73.9% had sex with partners they found online [41]. However, prevention programs targeting MSM are not implemented effectively in Taiwan because homosexuality is highly stigmatized and many MSM do not come out[31].

An increasing concern is young people who are becoming infected. Those aged 20-29 represent the highest number of total HIV cases, accounting for 40% through 2012 [34]. According to a study among college students, only 48.5% know that HIV can be spread through infected semen [49]. Regarding other risk populations, no updated information was available in English.

Japan

Japan has the second largest population after China, with 127 million [4]. The first officially reported case of AIDS was in 1985, a homosexual Japanese man who had been living in New

York. But, the first outbreak of the epidemic occurred among around 2000 recipients of contaminated blood products from the United States (most of them hemophiliacs) [33]. Until the mid-1990s they accounted for approximately 55% of HIV and AIDS cases[50]. After the introduction of heat-treated blood products in 1985 the proportion of infections through this route declined amid a gradual increase in cases due to sexual contact. Prostitution is illegal in Japan, but adult entertainment industry is well-established. In the early 1990s many women from other Asian countries arrived in Japan as commercial sex workers (CSWs). A peak in the number of foreign women infected with HIV, most of them infected outside Japan, was observed between 1991 and 1994, but fell markedly thereafter[50]. Currently, the male-to-female ratio is 16:1 and 12:1 for HIV and AIDS cases respectively, with the epidemic among women and non-Japanese contained at low level.

As of the end of 2012, 14,706 HIV and 6,719 AIDS cases were reported to the national HIV/AIDS surveillance (Table 1) [51]. Though the prevalence of HIV in the general population still remains very low (0.018%) [52], the HIV epidemic has been disproportionally concentrated in a particular subpopulation, men who have sex with men (MSM). In a preliminary study the cumulative number of reported HIV/AIDS cases infected through sex between men through 2008 was estimated to be 8.82 per 1000 of estimated MSM population aged 20 to 59; 68 times greater than non-MSM [53]. But in large cities such as Tokyo and Nagoya, HIV prevalence among MSM who visited free HIV testing sites has been calculated to be 5.7% and 4.5%, respectively [54]. The number of newly reported HIV cases of MSM more than doubled from 314 in 2001 to 724 in 2012 (Figure 1). In 2012, 74% (683/920) of Japanese male HIV cases were through this route, of which 67% (460/683) were aged 20 to 39 [55]. Since the peak in 2008 the number of Japanese MSM HIV cases in this age group has been declining. But, it is of great concern that teenage cases are on the rise since 2005 [55]. Evidence suggests that high proportions of MSM engage in risky behaviors such as unprotected anal sex (UAS), illicit drug use and sex with multiple partners [56, 57]. Without new interventions it has been projected that HIV prevalence among MSM could reach 10.4% in 2040 [58].

The number of AIDS cases reported in Japan is considerably lower than in other industrialized countries. But newly reported AIDS cases (without prior diagnosis of HIV infection) continue to increase since the beginning of the epidemic, especially the cases of homosexual contact, contrary to other developed countries, where a clear downward trend has been observed since the introduction of antiretroviral therapy (ART) in the mid-1990s [59]. Despite availability of ART, social awareness and public perception about HIV infection remain extremely low [60] as well as the number of people who use the free HIV testing service at public health centers in Japan [55]. Thus, systematic efforts and strategy to raise awareness and improve access to HIV testing should be strongly encouraged, particularly among MSM population.

Regarding other routes of transmission, infection through injecting drug use (IDU) is very limited, representing 0.4% and 0.7% of the HIV and AIDS cases through 2012. Finally, transmission from mother to child accounts for only 0.2% and 0.3% of the HIV and AIDS cases in the same period [55].

South Korea

Since the first case in 1985, the number of HIV-infected South Koreans reported through 2012 was 9410, of whom 7788 were currently living with HIV (Table 1) [61]. Available

statistics do not distinguish cases of HIV infection from cases with AIDS. As of 2011, the Korean Centers for Disease Control and Prevention estimated the HIV prevalence rate to be 14.1 per 100,000 population [62]. Other studies estimated the HIV prevalence in hospitals in 1.3 per 10,000 individuals (2008) [63] and in public health centers in 4.4 per 10,000 individuals (2009) [64]. Although HIV prevalence is very low, the number of newly reported HIV cases increased sharply since 2000, from 219 to 868 in 2012 [62].

The main route of transmission since the beginning of the HIV epidemic has been sexual contact, mostly affecting the male population (93.1% of cumulative cases) [61]. Even though, the male-to-female ratio of newly reported cases decreased from 17:1 in 2007 to 14:1 in 2012 [61], a recent study projected a widening to 19:1 by 2017 [65]. Heterosexual and homosexual contact accounted for 34.2% and 24.6% of newly reported HIV cases among South Koreans in 2011 (Table 2) [66]. But, it is reasonable to speculate that the rate of homosexual transmission may be much higher given the high gender imbalance and low prevalence among women and FSWs [67, 68]. Data from the Korea HIV/AIDS Cohort indicated homosexual contact was a major transmission route of recently identified infected individuals [69]. Latest studies among MSM found the prevalence of HIV ranging between 2.7% and 6.5% [70, 71]. In addition, high prevalence of self-reported STIs in the last year (10.7%) and current syphilis (20.4%) were found in this population. Over 50% of MSM reported being drunk while having sex, having bisexual relationships, multiple sexual partners, and inconsistent condom use with male and female partners [71, 72]. Therefore, MSM may serve as a bridge for the transmission of HIV to the population at large.

Transmission through IDU is rare in Korea. Until 2012, there were only 4 HIV/AIDS cases due to IDU, all among men. Some authors speculate this could be due to the low prevalence of illicit drug use, and needles and syringes being available over the counter [68]. However, a recent study found high prevalence of Hepatitis B, C and ever-sharing injecting equipment among IDUs [73]. CSWs and migrant workers constitute other vulnerable groups. CSW is illegal and there is no official report on the number of CSWs infected with HIV [68]. But, studies have shown very low prevalence in this population [67, 68]. As of 2012, there had been 1042 foreigners infected with HIV (71% male), the majority from Asia and Africa [66]. Foreigners account for only 3% of the total population, but represent 10% of the cumulative HIV/AIDS cases. Also, among test takers in public health centers foreigners showed much higher HIV prevalence than Koreans (6.8 vs 4.2 per 10,000 HIV-tested individuals) [64].

In recent years, greater attention has been placed in the need to promote timely testing [74-76]. The proportion of late presenters has increased since 1999 after abolition of a government policy of mass mandatory screening [75]. Despite the significant improvement of survival since the introduction of HAART there was a high risk of early mortality in the period 2002-2011 probably due to late diagnosis and late presentation to care [74, 75].

Finally, similar to other countries in Asia, homosexuality is heavily stigmatized in South Korea and many do not come out [77]. Also, unsafe sex behaviors even with high risk partners [78], misconceptions about HIV transmission, and negative attitudes towards PLHIV are still prevalent [79]. Thus, it is necessary to monitor and implement appropriate strategies to prevent further spread of the epidemic.

Hong Kong

Hong Kong is a Special Administrative Region of China since 1997. With a population of 7.2

million and the vast majority being ethnic Chinese, Hong Kong is one of the most densely populated areas in the world [4]. In contrast to mainland China, HIV epidemic has remained at a relatively low level, both among the general and high risk populations. HIV prevalence among blood donors, STI clinic attendees, pregnant women, and methadone clinic patients was 0.001%, 0.172%, 0.01%, and 0.489%, respectively in 2009 [80]. Since the first HIV case was reported in 1984, a total of 5,783 HIV cases (3,500 Chinese and 1,725 foreigners) and 1,353 AIDS case (980 Chinese and 287 foreigners) have been reported through 2012 (Table 1) [81]. The number of new HIV reports hit a record high of 513 cases in 2012, 17% increase from the previous year, of which 50.7% were through homosexual or bisexual contact. The male-to-female ratio increased from 2.6:1 in 2010 to 3.5:1 in 2012, further increasing male predominance. Overall, young male adult Chinese are the group that is most affected [82].

Sixty four hemophilia patients were the first population to be infected through contaminated blood. They were infected prior to 1985, before a safe heat treated alternative and test for HIV became available [32]. Subsequently, most infections were from sexual contact, with infections through IDU less common. Over the years, sexual transmission has remained the predominant route of infection. In the 1980s the largest percentage of new infections was through sex between men. In 1987, 57.6% of the new cases were attributable to homosexual or bisexual contact, whereas only 9.1% to heterosexual contact. Then, in the 1990s until mid-2000s the situation reversed and heterosexual transmission surpassed that of homosexual or bisexual contact. In 2000, 62.8% of new HIV infections were through heterosexual contact compared to 15.8% through homosexual or bisexual contact. But, situation has reversed again since 2004 when a sharp increase in the HIV cases of MSM became apparent, while the heterosexual transmission remained relatively stable [62] (Figure 1).

Similar to other parts of the world, MSM in Hong Kong are seeking sex partners through the Internet [83]. Over half of MSM recently diagnosed with HIV infection found sex partners through the Internet in the year prior to their infection [83]. Another study revealed a high proportion of MSM in Hong Kong seeking cross-border sex and having UAS with multiple type and number of male sex partners in Shenzhen, where high prevalence of HIV and syphilis was reported among MSM [84]. In the last six months, 62.1% of MSM in Hong Kong had had sex with male CSWs, 84.6% with male non-regular partners, and 31.3% with male regular partners in Shenzhen [84]. Prevalence of UAS with these types of partners was 29.8%, 27.9%, and 78.7%, respectively. Prior to 2005 there were only two non-governmental organizations which ran condom distribution and outreach testing programs for MSM in saunas and bars [85]. MSM have been identified as the pressing priority for action in the five year AIDS Strategies from the Advisory Council on AIDS.

Unlike the remarkable spread of HIV among IDUs in mainland China and Taiwan, the HIV epidemic among drug users in Hong Kong remained low. Before the start of the HIV epidemic, MMT (1976) and the STI clinic services of the Department of Health (1970s) were widely accessible in Hong Kong [86]. Both programs provided preventive interventions, free condoms, and treatment for drug users and patients with STIs. It has been argued that they played key roles in protecting people at elevated risk for contracting HIV [86, 87]. Also, the prevalence of HIV among methadone clinic attendees remained at consistently low level of 0.2-0.5% from 2004 to 2010 [88]. HIV infection among IDUs has contributed to only 1.4% (7/513) of all cases in 2012, a marked decrease from 58 cases in 2006. Nevertheless, the potential risk of an upsurge among this population cannot be disregarded as significant proportions engage in unsafe behaviors [89, 90].

HIV prevalence among FSWs was low, 0.2% between 2005 and 2007 [91]. However, cross-

border (from Hong Kong to mainland China) FSW is common [92]. With increasing population mobility and growing HIV epidemics in neighboring countries, sub-population with elevated risk of infection need to be closely monitored.

Mongolia

Mongolia is a landlocked country located in Northeast Asia, bordered by the Russian Federation (Russia) to the north and China to the south, two countries with rapidly expanding HIV epidemics. With a small population of 2.8 million, more than 1 million are registered residents of Ulaanbaatar city, the capital and largest city [4]. Mongolia has the smallest HIV epidemic in the region, prevalence in the general population is less than 0.1% [1, 93] despite high prevalence of other STIs among different population groups [94-96]. Between 1992 and 2004 only 5 cases of HIV were reported [97], 2 of whom were AIDS cases (personal communication with UNAIDS Mongolia) (Table 1). However, the number of HIV and AIDS cases has been increasing sharply in recent years. A total of 126 cases have been reported by the end of 2012, more than 60% of them within the last 4 years and 91% of cases identified in Ulaanbaatar [97]. According to official statistics 17 have died by the end of 2012 [97]. The sharp increase in HIV cases could respond to an increasing incidence of HIV and improved HIV surveillance system [97-100]. Epidemic estimates (by Spectrum) show that at the end of 2013, the number of PLHIV stood at 655. Of these, 73.3% were MSM (personal communication with UNAIDS Mongolia).

To date, all cases for which route of transmission is known have been attributed to sexual contact, predominantly MSM (Figure 1). Until 2011, 80% of HIV cases were males, 82.5% of them MSM [93]. This is probably an underestimation given that data on sexual orientation was not collected until 2007. Among the female cases, 52% were CSWs. There are no reported cases of HIV transmission related to blood or vertical transmission. Unlike the neighboring countries of Russia and China, no cases have been found among IDUs in Mongolia [93, 101].

A series of second generation surveillance surveys (SGSS) have been the main source of information in Mongolia over the past decade. MSM and FSWs are currently the population most at risk. The prevalence among MSM during the 2005, 2007, 2009, and 2011 SGSS was 0.0%, 0.85%, 1.80%, and 7.5%, respectively [98-100]. The sharp increase in the HIV prevalence has been argued to be an artifact possibly due to changes in the cases included for estimations (only new HIV cases vs. new and previously identified cases), sampling strategies (convenience vs. response driven sampling (RDS)), sample sizes (88 in 2005 compared to 200 in 2011), and improvements in surveillance [93, 102]. However, 7.5% HIV prevalence rate found in the last round of SGSS may be comparable to 6.3% self-reported HIV prevalence observed during a survey among MSM in Ulaanbaatar in 2011 using RDS [103]. There is evidence suggesting risky behaviors among MSM [95, 102-104]. Furthermore, low HIV-related knowledge regarding the risks associated with same-sex practices, low exposure to prevention programs (33.6%) and high misconception about HIV transmission have been reported [102, 103]. It should also be noted that there is very limited research on MSM done to date (no data available from outside the capital city) [105], high levels of discrimination, including violence, and low societal acceptance of MSM [106].

Even though previous SGSS did not find HIV infection among FSWs, overall prevalence of syphilis in this population was consistently high ranging from 17.4% in 2005 to 27.8% in 2011. High risk sexual behaviors are still common among FSWs and many have

misconceptions about HIV transmission [102]. The illegal character of sex work coupled with high rates of poverty and unemployment may lead increasing numbers of women into sex work for survival [107]. Little is known about other vulnerable groups such as, IDUs, mobile populations, and clients of FSWs. Low impact behavioral interventions should be considered since they can achieve considerable reductions of HIV and STI risk in such a low resource setting [108].

Conclusion

Although the HIV epidemic East Asia reached relatively late, it expanded region wide driven by the epidemic in China. Because of the timely and effective measures, great progress has been achieved in the control of the HIV epidemic. However, in most of the countries or areas of the region the greatest concern is the growing epidemic among MSM population that has been neglected for many years. Large-scale prevention needs to be tailored to this subpopulation with careful monitoring and evaluation, addressing appropriately the issues of discrimination and stigmatization. Governments need to have strong commitment because the potential consequences of inaction are huge and could have disastrous implications.

Acknowledgments

We greatly appreciate the help of Altanchimeg Delegchoimbol at UNAIDS Mongolia, Sergelen Munkhbaatar at Mongolia Ministry of Health, and Jin Young Ahn at Yonsei University College of Medicine in Korea for facilitating us with national data and/or country reports. Finally, our appreciation goes to Bishal Gyawali at the University of Southern Denmark for his assistance in the early stages of this review.

Conflict of interest

The authors declare that they have no conflict of interest relevant to this article.

References

Papers of particular interest, published recently, have been highlighted as:

* Of importance

** Of major importance

1. UNAIDS: *Global report: UNAIDS report on the global AIDS Epidemic 2013*. Switzerland; 2013.
2. Piot P, Quinn TC: **Response to the AIDS pandemic--a global health model**. *N Engl J Med* 2013, **368**(23):2210-2218.
3. Quinn TC: **Global burden of the HIV pandemic**. *Lancet* 1996, **348**(9020):99-106.
4. Central Intelligence Agency: **The World Factbook 2013-14** [https://www.cia.gov/library/publications/the-world-factbook/index.html] (Last accessed: January 19th, 2014).

5. Ministry of Health of the People's Republic of China, UNAIDS, WHO: *2011 Estimates for the HIV/AIDS epidemic in China*; 2011.
6. **Zhang L, Chow EP, Jing J, Zhuang X, Li X, He M, Sun H, Gorgens M, Wilson D, Wang L *et al*: **HIV prevalence in China: integration of surveillance data and a systematic review**. *Lancet Infect Dis* 2013, **13**(11):955-963.
The authors analyzed the HIV prevalence trends between 1990 and 2012.They collected data from more than 1800 sentinel sites across all Chinese provinces and did a systematic review of 821 independent published studies. Their study showed that HIV prevalence among MSM is increasing at an alarming rate across all regions, suggesting that sex between men has become the main route of transmission.
7. Wu Z, Sullivan S: **China**. In: *Fighting a Rising Tide: The Response to AIDS in East Asia.* edn. Edited by Yamamoto T, Itoh S. Tokyo: Japan Center for International Exchange; 2006: 76-95.
8. Zhang Kl KL, Ma SJ: **Epidemiology of HIV in China**. *BMJ* 2002, **324**(7341):803-804.
9. Xiao Y, Kristensen S, Sun J, Lu L, Vermund SH: **Expansion of HIV/AIDS in China: Lessons from Yunnan Province**. *Soc Sci Med* 2007, **64**(3):665-675.
10. Wu Z, Liu Z, Detels R: **HIV-1 infection in commercial plasma donors in China**. *Lancet* 1995, **346**(8966):61-62.
11. Dou Z, Chen RY, Wang Z, Ji G, Peng G, Qiao X, Fu J, Meng X, Bulterys M, Ma Y *et al*: **HIV-infected former plasma donors in rural Central China: from infection to survival outcomes, 1985-2008**. *PLoS One* 2010, **5**(10):e13737.
12. Sheng L, Cao WK: **HIV/AIDS epidemiology and prevention in China**. *Chin Med J (Engl)* 2008, **121**(13):1230-1236.
13. Wu Z, Sun X, Sullivan SG, Detels R: **HIV Testing in China**. *Science* 2006, **312**(5779):1475-1476.
14. Ministry of Health of the People's Republic of China, UNAIDS, WHO: *2005 Update on the HIV/AIDS Epidemic and Response in China*. Beijing; 2006.
15. He N, Detels R: **The HIV epidemic in China: history, response, and challenge**. *Cell Res* 2005, **15**(11-12):825-832.
16. Sullivan SG, Wu Z: **Rapid scale up of harm reduction in China**. *Int J Drug Policy* 2007, **18**(2):118-128.
17. Ministry of Health of the People's Republic of China: *2012 China AIDS Response Progress Report*; 2012.
18. **Wu Z, Xu J, Liu E, Mao Y, Xiao Y, Sun X, Liu Y, Jiang Y, McGoogan JM, Dou Z *et al*: **HIV and Syphilis Prevalence Among Men Who Have Sex With Men: A Cross-Sectional Survey of 61 Cities in China**. *Clin Infect Dis* 2013, **57**(2):298-309.
This study is a rigorous epidemiologic work on more than 47,000 MSM; probably the largest study to date on HIV and syphilis prevalence among MSM. The authors found high prevalence of HIV and syphilis with similar risk factors but distinct geographical distribution, attributed by the authors to diverse transmission dynamics.
19. UNAIDS: **HIV in China: Facts and Figures** [http://www.unaids.org.cn/en/index/page.asp?id=197&class=2&classname=China+Epidemic+%26+Response] (Last accessed: January 10th, 2013).
20. Zhong F, Lin P, Xu H, Wang Y, Wang M, He Q, Fan L, Li Y, Wen F, Liang Y *et al*: **Possible increase in HIV and syphilis prevalence among men who have sex with men in Guangzhou, China: results from a respondent-driven sampling survey**. *AIDS Behav* 2011, **15**(5):1058-1066.
21. Chow EP, Wilson DP, Zhang L: **HIV and syphilis co-infection increasing among**

men who have sex with men in China: a systematic review and meta-analysis. *PLoS One* 2011, **6**(8):e22768.

22. Chow EP, Jing J, Feng Y, Min D, Zhang J, Wilson DP, Zhang X, Zhang L: **Pattern of HIV testing and multiple sexual partnerships among men who have sex with men in China**. *BMC Infect Dis* 2013, **13**(1):549.
23. Feng Y, Wu Z, Detels R: **Evolution of men who have sex with men community and experienced stigma among men who have sex with men in Chengdu, China**. *J Acquir Immune Defic Syndr* 2010, **53 Suppl 1**:S98-103.
24. *Chow EP, Wilson DP, Zhang L: **What is the potential for bisexual men in China to act as a bridge of HIV transmission to the female population? Behavioural evidence from a systematic review and meta-analysis**. *BMC Infect Dis* 2011, **11**:242.
This study provides a comprehensive analysis of the bisexual characteristics of Chinese MSM during 2001 to 2010. Bisexual behavior among MSM is common in China to conceal their homosexuality and conform to Chinese social norms.
25. Yang Z, Su J, Peng X, Wu N: **A Decline in HIV and Syphilis Epidemics in Chinese Female Sex Workers (2000-2011): A Systematic Review and Meta-Analysis**. *PLoS One* 2013, **8**(12):e82451.
26. Yingying H, Smith K, Suiming P: **Changes and correlates in multiple sexual partnerships among Chinese adult women--population-based surveys in 2000 and 2006**. *AIDS Care* 2011, **23 Suppl 1**:96-104.
27. Liu J, Huang Y, Wang J, Guo N, Li J, Dong X, Ma H, Tiemuer M, Huang M, Wright DJ *et al*: **The increasing prevalence of serologic markers for syphilis among Chinese blood donors in 2008 through 2010 during a syphilis epidemic**. *Transfusion (Paris)* 2012, **52**(8):1741-1749.
28. Qian HZ, Vermund SH, Wang N: **Risk of HIV/AIDS in China: subpopulations of special importance**. *Sex Transm Infect* 2005, **81**(6):442-447.
29. Wu Z, Sullivan SG, Wang Y, Rotheram-Borus MJ, Detels R: **Evolution of China's response to HIV/AIDS**. *Lancet* 2007, **369**(9562):679-690.
30. Lau JT, Lin C, Hao C, Wu X, Gu J: **Public health challenges of the emerging HIV epidemic among men who have sex with men in China**. *Public Health* 2011, **125**(5):260-265.
31. Centers for Disease Control R.O.C. (Taiwan): **HIV/AIDS** [http://www.cdc.gov.tw/english/page.aspx?treeid=e79c7a9e1e9b1cdf&nowtreeid=6bb9113c9e323e98] (Last accessed: December 25, 2013).
32. Study Group on HIV Infection of Haemophiliacs: *Report of the study group on HIV infection of haemophiliacs through blood products in Hong Kong*. Hong Kong; 1993.
33. Feldman EA: **HIV and Blood in Japan: Transforming Private Conflict into Public Scandal**. In: *Blood Feuds: AIDS, Blood, and the Politics of Medical Disaster.* edn. Edited by Feldman EA. New York: Oxford University Press; 1999.
34. Centers for Disease Control R.O.C. (Taiwan): **HIV/AIDS (1984 - 2012/12/31)** [http://www.cdc.gov.tw/english/info.aspx?treeid=00ED75D6C887BB27&nowtreeid=334C2073091C8677&tid=EA2CB016562D29C9] (Last accessed: January 17th, 2014).
35. Centers for Disease Control R.O.C. (Taiwan): **Annual reported number of cases of HIV among Taiwanese by risk factor** [http://www.cdc.gov.tw/professional/downloadfile.aspx?fid=909C64F271CE1554] (Last accessed: January 19th, 2014).
36. Centers for Disease Control Ministry of Health and Welfare R.O.C. (Taiwan):

Statistics of Communciable Diseases and Surveillance Report. Taipei; 2013.
37. Centers for Disease Control Ministry of Health and Welfare R.O.C. (Taiwan): *Annual Report*. Taipei; 2013.
38. UNAIDS: **Welcome (not)** [http://www.unaids.org/en/resources/infographics/20120514travel/] (Last accessed: January 18th, 2014).
39. Chu FY, Chiang SC, Su FH, Chang YY, Cheng SH: **Prevalence of human immunodeficiency virus and its association with hepatitis B, C, and D virus infections among incarcerated male substance abusers in Taiwan**. *J Med Virol* 2009, **81**(6):973-978.
40. *Ko N-Y, Lee H-C, Hung C-C, Tseng F-C, Chang J-L, Lee N-Y, Chang C-M, Lee M-P, Chen B-J, Wang S-W *et al*: **Trends of HIV and Sexually Transmitted Infections, Estimated HIV Incidence, and Risky Sexual Behaviors Among Gay Bathhouse Attendees in Taiwan: 2004–2008**. *AIDS Behav* 2011, **15**(2):292-297.
The paper identifies increasing HIV prevalence in MSM attending bathhouses in Taiwan from 2004-2007. Revealing that behavior is extremely risky, approximately 20%-30% of UAI and MSP and 80% of unprotected oral sex in the last visit to bathhouse. Recreational drug use may lead them to the perpetuating risk behaviors. Interventions at bath house are urgently needed.
41. Ko N-Y, Koe S, Lee H-C, Yen C-F, Ko W-C, Hsu S-T: **Online Sex-Seeking, Substance Use, and Risky Behaviors in Taiwan: Results from the 2010 Asia Internet MSM Sex Survey**. *Arch Sex Behav* 2012, **41**(5):1273-1282.
42. Lin HH, Shih YL, Liu YC, Lee SS, Huang CK, Chen YL, Chin C, Lai CH, Tsai HC, Guo YC *et al*: **An epidemic of HIV type I CRF07_BC infection among injection drug users in Taiwan**. *J Acquir Immune Defic Syndr* 2006, **42**(2):248-255.
43. Lin Y-T, Lan Y-C, Chen Y-J, Huang Y-H, Lee C-M, Liu T-T, Wong W-W, Yang J-Y, Wang C-T, Chen Y-MA: **Molecular Epidemiology of HIV-1 Infection and Full-Length Genomic Analysis of Circulating Recombinant Form 07_BC Strains from Injection Drug Users in Taiwan**. *J Infect Dis* 2007, **195**(9):1283-1293.
44. Chen Y-MA, Lan Y-C, Lai S-F, Yang J-Y, Tsai S-F, SH-S K: **HIV-1 CRF07_BC infections, injecting drug users, Taiwan [letter]**. *Emerg Infect Dis* 2006.
45. Lee TS, Shen HC, Wu WH, Huang CW, Yen MY, Wang BE, Chuang P, Shih CY, Chou YC, Liu YL: **Clinical characteristics and risk behavior as a function of HIV status among heroin users enrolled in methadone treatment in northern Taiwan**. *Subst Abuse Treat Prev Policy* 2011, **6**:6.
46. Liu JY, Lin HH, Liu YC, Lee SS, Chen YL, Hung CC, Ko WC, Huang CK, Lai CH, Chen YS *et al*: **Extremely high prevalence and genetic diversity of hepatitis C virus infection among HIV-infected injection drug users in Taiwan**. *Clin Infect Dis* 2008, **46**(11):1761-1768.
47. Chen Y-MA, Chen Y-H, Lin Y-T, Lim P-L, Yunihastuti E, Kiertiburanakul S, Merati T, Chaiwarith R, Phanuphak P, Li P-C *et al*: **Hepatitis B (HBV) and hepatitis C (HCV) co-infection: long term immunological, virological and survival outcomes following cART**. In: *7th International AIDS Society Conference on HIV Pathogenesis, Treatment and Prevention.* Kuala Lumpur; 2013.
48. Ko NY, Lee HC, Chang JL, Lee NY, Chang CM, Lee MP, Lin YH, Lai KY, Ko WC: **Prevalence of human immunodeficiency virus and sexually transmitted infections and risky sexual behaviors among men visiting gay bathhouses in taiwan**. *Sex Transm Dis* 2006, **33**(8):467-473.
49. Tung WC, Ding K, Farmer S: **Knowledge, attitudes, and behaviors related to HIV and AIDS among college students in Taiwan**. *J Assoc Nurses AIDS Care* 2008,

19(5):397-408.
50. Kihara M, Ono-Kihara M, Feldman MD, Ichikawa S, Hashimoto S, Eboshida A, Yamamoto T, Kamakura M: **HIV/AIDS surveillance in Japan, 1984-2000.** *J Acquir Immune Defic Syndr* 2003, **32 Suppl 1**:S55-62.
51. Study Group on HIV/AIDS Epidemiology and Intervention: *Surveillance and preventive activities for HIV/AIDS infection among high risk populations and monitoring of local and global epidemiologic trends of HIV/AIDS.* Japan; 2013.
52. Japan Foundation for AIDS Prevention: **Japan: HIV/AIDS update.** *ICAAP11, Bangkok, Thailand, November 18-22* 2013.
53. Ichikawa S, Kaneko N, Koerner J, Shiono S, Shingae A, Ito T: **Survey investigating homosexual behaviour among adult males used to estimate the prevalence of HIV and AIDS among men who have sex with men in Japan.** *Sex Health* 2011, **8**(1):123-124.
54. Kojima H: **The Viewpoint of a Specialist from an Outsourced HIV Counseling and Testing Service.** In: *22nd Japanese Society for AIDS Research.* Osaka, Japan; 2008.
55. Ministry of Health Labour and Welfare (MHLW): *Annual Report of the National AIDS Surveillance Committee for year 2012.* Tokyo; 2013.
56. Hidaka Y, Ichikawa S, Koyano J, Urao M, Yasuo T, Kimura H, Ono-Kihara M, Kihara M: **Substance use and sexual behaviours of Japanese men who have sex with men: a nationwide internet survey conducted in Japan.** *BMC Public Health* 2006, **6**:239.
57. Nishijima T, Gatanaga H, Komatsu H, Takano M, Ogane M, Ikeda K, Oka S: **High Prevalence of Illicit Drug Use in Men Who Have Sex with Men with HIV-1 Infection in Japan.** *PLoS One* 2013, **8**(12):e81960.
58. **Gilmour S, Li J, Shibuya K: **Projecting HIV transmission in Japan.** *PLoS One* 2012, **7**(8):e43473.
This study highlights the need for new strategies to reach the MSM population. It points out gaps in the current knowledge about the key risk behaviors among this population and provides some recommendations.
59. Palella FJ, Delaney KM, Moorman AC, Loveless MO, Fuhrer J, Satten GA, Aschman DJ, Holmberg SD: **Declining Morbidity and Mortality among Patients with Advanced Human Immunodeficiency Virus Infection.** *N Engl J Med* 1998, **338**(13):853-860.
60. Itoh S: **Japan.** In: *Fighting a Rising Tide: The Response to AIDS in East Asia.* edn. Edited by Yamamoto T, Itoh S. Tokyo: Japan Center for International Exchange (JCIE); 2006: 119-155.
61. Korea Centers for Disease Control and Prevention: *Annual Report on the Notified HIV/AIDS in Korea*; 2013.
62. Korea Centers for Disease Control and Prevention: *HIV/AIDS Control in the Republic of Korea.* Seoul; 2011.
63. Lee JH, Hong KJ, Wang JS, Kim SS, Kee MK: **Estimation of hospital-based HIV seroprevalence as a nationwide scale by novel method; 2002-2008 in Korea.** *BMC Public Health* 2010, **10**:739.
64. *Kee MK, Lee JH, Whang J, Kim SS: **Ten-year trends in HIV prevalence among visitors to public health centers under the National HIV Surveillance System in Korea, 2000 to 2009.** *BMC Public Health* 2012, **12**:831.
Large study (HIV/AIDS Cohort 2006) in Korea showing low HIV prevalence among high risk groups attending public health centers. Also, showed that HIV prevalence

among "anonymous testers" was highest highlighting the importance to ascertain the characteristics of people choosing to take voluntary testing.

65. Yu H-K, Kim N-Y, Kim SS, Chu C, Kee M-K: **Forecasting the Number of Human Immunodeficiency Virus Infections in the Korean Population Using the Autoregressive Integrated Moving Average Model**. *Osong Public Health Res Perspect* 2013, **4**(6):358-362.
66. Korea Centers for Disease Control and Prevention: *2011 Annual Report on the Notified HIV/AIDS in Korea*; 2012.
67. Kweon S-S, Shin M-H, Song H-J, Jeon D-Y, Choi J-S: **Seroprevalence and Risk Factors for Hepatitis C Virus Infection Among Female Commercial Sex Workers in South Korea Who are not Intravenous Drug Users**. *The American Journal of Tropical Medicine and Hygiene* 2006, **74**(6):1117-1121.
68. Surin S: **Republic of Korea**. In: *Fighting a Rising Tide: the Reponse to AIDS in East Asia.* edn. Edited by Yamamoto T, Itoh S. Tokyo: Japan Center for International Exchange; 2006: 156-171.
69. Lee J-H, Kim SH, Wang J-S, Sung KM, Kim SS, Kee M-K: **Epidemiological and Immunological Characteristics at the Time of HIV Diagnosis for HIV/AIDS Cohort Registrants Representative of HIV-Infected Populations in Korea**. *Osong Public Health Res Perspect* 2012, **3**(2):100-106.
70. Sohn A, Cho B: **Knowledge, Attitudes, and Sexual Behaviors in HIV/AIDS and Predictors Affecting Condom Use among Men Who Have Sex with Men in South Korea**. *Osong Public Health Res Perspect* 2012, **3**(3):156-164.
71. Jung M, Lee J, Kwon DS, Park B-J: **Comparison of Sexual Risky Factors of Men Who Have Sex With Men and Sex-buying Men as Groups Vulnerble to Sexually Transmitted Diseases**. *J Prev Med Public Health* 2012, **45**(3):156-163.
72. Sohn A, Park S: **HIV/AIDS Knowledge, Stigmatizing Attitudes, and Related Behaviors and Factors that Affect Stigmatizing Attitudes against HIV/AIDS among Korean Adolescents**. *Osong Public Health Res Perspect* 2012, **3**(1):24-30.
73. Min JA, Yoon Y, Lee HJ, Choi J, Kwon M, Kim K, Lee CU, Kim DJ, Yun H: **Prevalence and associated clinical characteristics of hepatitis B, C, and HIV infections among injecting drug users in Korea**. *J Med Virol* 2013, **85**(4):575-582.
74. *Lee SH, Kim KH, Lee SG, Chen DH, Jung DS, Moon CS, Park JY, Chung JS, Kwak IS, Cho GJ: **Trends of mortality and cause of death among HIV-infected patients in Korea, 1990-2011**. *J Korean Med Sci* 2013, **28**(1):67-73.
This study revealed that a high proportion of pacients are presenting late to care thus having early mortality. In a time when antiretroviral treatment is available, this study underlines the importance for early testing and diagnosing to get appropiate care.
75. Choe PG, Park WB, Song JS, Kim NH, Park JY, Song KH, Park SW, Kim HB, Kim NJ, Oh MD: **Late presentation of HIV disease and its associated factors among newly diagnosed patients before and after abolition of a government policy of mass mandatory screening**. *J Infect* 2011, **63**(1):60-65.
76. Kee MK, Lee JH, Kim EJ, Lee J, Nam JG, Yoo BH, Kim SS: **Improvement in survival among HIV-infected individuals in the Republic of Korea: need for an early HIV diagnosis**. *BMC Infect Dis* 2009, **9**:128.
77. Kim YG, Hahn SJ: **Homosexuality in ancient and modern Korea**. *Cult Health Sex* 2006, **8**(1):59-65.
78. Sohn A, Chun SS: **Gender differences in sexual behavior and condom-related behaviours and attitudes among Korean youths**. *Asia Pac J Public Health* 2007, **19**(2):45-52.
79. Sohn A, Park S: **Changes in Human Immunodeficiency Virus-related Knowledge**

and Stigmatizing Attitudes among Korean Adolescents from 2006 to 2011. *Osong Public Health Res Perspect* 2012, **3**(2):107-112.
80. Hong Kong Advisory Council on AIDS: *Annual Report August 2009 - July 2010*; 2011.
81. Special Preventive Programme Centre for Health Protection: *HIV Surveillance Report: 2011 Update*. Kowloon, Hong Kong; December 2012.
82. Special Preventive Programme Centre for Health Protection: *Factsheet on HIV/AIDS Situation in Hong Kong*. Kowloon, Hong Kong; 2012.
83. Lee SS, Tam DK, Mak DW, Wong K: **Use of the Internet for sex partnership in men who have sex with men before HIV infection**. *Public Health* 2011, **125**:433-435.
84. Lau JF, Cai W, Tsui H, Cheng J, Chen L, Choi K, Lin C: **Prevalence and Correlates of Unprotected Anal Intercourse Among Hong Kong Men Who Have Sex with Men Traveling to Shenzhen, China**. *AIDS Behav* 2013, **17**(4):1395-1405.
85. Ho R, Wong K: **Programme manager's viewpoint: Hong Kong (China) experience in combating the HIV epidemic among men who have sex with men**. *HIV/AIDS Prevention and Care Newsletter* 2010:3-5.
86. Chan MK-t, Lee S-s: **Can the low prevalence in Hong Kong be maintained?** *AIDS Educ Prev* 2004, **16**(A):18-26.
87. Lee SS: **The contribution of methadone maintenance treatment to HIV prevention - The case of Hong Kong**. In: *International Conference on Tackling Drug Abuse - Conference Proceedings*. Hong Kong: Narcotics Division; 2005: 191-205.
88. Special Preventive Programme Centre for Health Protection: *Factsheet HIV/AIDS Situation in Hong Kong*. Kowloon, Hong Kong; 2010.
89. Li H, Goggins W, Lee SS: **Multilevel analysis of HIV related risk behaviors among heroin users in a low prevalence community**. *BMC Public Health* 2009, **9**(137).
90. Lee KC, Lim WW, Lee SS: **High prevalence of HCV in a cohort of injectors on methadone substitution treatment**. *J Clin Virol* 2008, **41**(4):297-300.
91. Wong WCW, Yim YL, Lynn H: **Sexually Transmitted Infections Among Female Sex Workers in Hong Kong: The Role of Migration Status**. *J Travel Med* 2011, **18**(1):1-7.
92. Lau JT, Tsui HY: **Behavioral surveillance surveys of the male clients of female sex workers in Hong Kong: results of three population-based surveys**. *Sex Transm Dis* 2003, **Aug 30**(8):620-628.
93. Government of Mongolia: *AIDS reponse progress reporting*. Mongolia; 2012.
94. Tserenpuntsag B, Ouynbileg L, Nelson K, McNutt LA: **Prevalence of infectious diseases among Mongolian blood donors**. *J Infect Dev Ctries* 2008, **2**(1):73-75.
95. Davaalkham J, Unenchimeg P, Baigalmaa C, Oyunbileg B, Tsuchiya K, Hachiya A, Gatanaga H, Nyamkhuu D, Oka S: **High-risk status of HIV-1 infection in the very low epidemic country, Mongolia, 2007**. *Int J STD AIDS* 2009, **20**(6):391-394.
96. Amindavaa O, Kristensen S, Pak CY, Khalzan D, Chultemsuren B, Randall AS, Mikolon A, Lkhamsuren E, Tulgaa K, Chimeddorj B *et al*: **Sexually transmitted infections among pregnant women attending antenatal clinics in Mongolia: potential impact on the Mongolian HIV epidemic**. *Int J STD AIDS* 2005, **16**(2):153-157.
97. National Center for Communicable Diseases (NCCD): **HIV/AIDS cases ovierview** [http://www.nccd.gov.mn/index.php?option=com_content&view=article&id=386:2013-11-29-05-29-40&catid=21:2011-09-01-03-24-23&Itemid=42] (Last accessed:

January 19th, 2014).
98. Mongolia Ministry of Health: *Second Generation HIV/STI Surveillance Report.* Mongolia; 2005.
99. Mongolia Ministry of Health: *Second Generation HIV/STI Surveillance Report.* Mongolia; 2007.
100. Mongolia Ministry of Health: *Second Generation HIV/STI Surveillance Report.* Mongolia; 2009.
101. Mongolia National Committee on HIV and AIDS: *UNGASS Country Progress Report: Mongolia*; 2010.
102. **Mongolia Ministry of Health: *Second Generation HIV/STI Surveillance Survey.* Mongolia; 2011.
This is a major source of informtion regarding the HIV epidemic in Mongolia since limited research has been published in English.

103. *Yasin F, Delegchoimbol A, Jamiyanjamts N, Sovd T, Mason K, Baral S: **A cross-sectional evaluation of correlates of HIV testing practices among men who have sex with men (MSM) in Mongolia**. *AIDS Behav* 2013, **17**(4):1378-1385.
This study used a rigourous methodology and provided data on HIV prevalence, patterns and associations of HIV testing, and HIV related knowledge among MSM.
104. Mathers B, Wodak A, Shakeshaft A, Merghati Khoei E, Dolan K: *A rapid assessment and response to HIV and drug use in Mongolia*. Sydney; 2009.
105. National Committee on HIV/AIDS: *Mongolian National Strategic Plan on HIV, AIDS and STIs, 2010-2015*. Ulaanbaatar; 2010.
106. Yasin F, Delegchoimbol A, Jamiyanjamts N, Mason K, Baral S: **A cross-sectional assessment of HIV risk status and human rights abuses among men who have sex with men (MSM) in Mongolia [Poster]**. *XIX International AIDS Conference, July 22-27 Washington DC, USA* 2012.
107. Tsai LC, Witte SS, Aira T, Riedel M, Hwang HG, Ssewamala F: **"There is no other option; we have to feed our families...who else would do it?": The financial lives of women engaging in sex work in Ulaanbaatar, Mongolia**. *Glob J Health Sci* 2013, **5**(5):41-50.
108. *Witte SS, Altantsetseg B, Aira T, Riedel M, Chen J, Potocnik K, El-Bassel N, Wu E, Gilbert L, Carlson C *et al*: **Reducing sexual HIV/STI risk and harmful alcohol use among female sex workers in Mongolia: a randomized clinical trial**. *AIDS Behav* 2011, **15**(8):1785-1794.

This study shows that even low impact interventions can achieve reductions of HIV and STI risk among FSW. Feasable and positively endorsed interventions are particularly important in low resourced settings.

Table 1. Annual reported number of HIV and AIDS cases in China, Taiwan, Japan, South Korea, Hong Kong, and Mongolia (1984 - 2012)

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
HIV															
China	-	5	1	9	7	171	299	216	261	274	531	1,567	2,649	3,343	3,306
Taiwan	9	14	9	12	21	37	31	78	123	132	160	221	267	341	388
Japan[3]	-	0	0	55	23	80	66	200	442	277	298	277	376	397	422
South Korea[4]	-	1	3	9	22	37	52	46	81	69	89	108	104	125	129
Hong Kong[5]	7	46	20	33	28	38	34	60	71	79	104	122	134	181	189
Mongolia[6]	-	-	-	-	-	-	-	-	1	0	0	0	0	1	0
AIDS															
China[1]	-	1	0	2	0	0	2	3	5	23	29	52	38	126	136
Taiwan[2]	0	0	1	1	2	8	5	13	23	35	64	97	156	136	153
Japan	-	6	5	14	14	21	31	38	51	86	136	169	234	250	231
South Korea[4]															
Hong Kong[5]	0	3	0	6	7	17	13	14	14	19	37	44	71	64	63
Mongolia[6]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-