

T, Kihara M. Early initiation of sexual activity: a risk factor for sexually transmitted diseases, HIV infection, and unwanted pregnancy among university students in China. BMC Public Health. (2009) Apr 22;9:111.

11) Hoque HE, Ono-Kihara M, Zamani S, Ravari SM, Kihara M. HIV-related risk behaviours and the correlates among rickshaw pullers of Kamrangirchar, Dhaka, Bangladesh: a cross-sectional study using probability sampling. BMC Public Health. (2009) Mar 11;9:80. PMID: 19284569

12) Ma Q, Ono-Kihara M, Cong L, Pan X, Xu G, Zamani S, Ravari SM, Kihara M. Behavioral and psychosocial predictors of condom use among university students in Eastern China. AIDS Care (2009) Feb;21(2):249-59.

【著書等】

<著書>

1) Masako Ono-Kihara. Sex behavior of teenagers in contemporary Japan: The WYSH Project. Sanko Publisher, Tokyo, Japan, 2011.

2) 木原正博、木原雅子訳. 疫学－医学的研究と実践のサイエンス 3 版 (Gordis L 他著). メディカル・サイエンス・インターナショナル、東京、2010 年

3) 木原雅子、木原正博. HIV 感染予防と社会－複合予防と WYSH プロジェクト. 最新医学別冊「HIV 感染症と AIDS」. 最新医学社、大阪、2010 年

4) 木原正博、木原雅子. エイズの流行－人間の安全保障を脅かす感染症. 地球環境学辞典、弘文堂、東京、2010.

5) 木原雅子、木原正博訳. 医学的研究のデザイナー－研究の質を高める疫学的アプローチ 3 版 (Hulley SB, Cummings SR 他著) メディカル・サイエンス・インターナショナル、東京、2009 年

<その他>

1) 木原雅子、木原正博. 社会と健康を科学するパブリックヘルス (2) ソシオ・エビデミオロジー (社会疫学)－その方法論的特徴と実践例について. 日本公衆衛生雑誌 58: 58-61, 2011 年

2) 木原雅子、木原正博. 現代社会にはびこる「見えない精神的暴力」－その背景とし人間的つながりの希薄化. 現代のエスプリ 511: 27-38, 2010

3) 木原正博、鬼塚哲郎、小野寺昭一、木原雅子、橋本修二. 世界的 HIV 流行の新局面 (ニューグローバルウェーブ) と日本. 日本エイズ学会誌 12(2) :41-45, 2010 年

4) 木原雅子、加藤秀子、木原正博. 新時代の HIV 感染症予防戦略. 臨床とウイルス 38: 270-6, 2010 年

5) 木原正博、木原雅子. 日本の HIV 流行の現状と推計・予測及び今後の展望について. 公

- 衆衛生 74(11): 6-9、2010年
- 6)木原正博. 社会と健康を科学するパブリックヘルス (1) 21世紀の課題と New Public health. 日本公衆衛生雑誌 57: 1094-1097, 2010年
 - 7)木原雅子、加藤秀子. 世界のエイズ最新事情と「複合予防」としての WYSH プロジェクト. 健 39(9): 22-27、2010年
 - 8)木原正博、鬼塚哲郎、小野寺昭一、木原雅子、橋本修二. 世界的 HIV 流行の新局面 (ニューグローバルウェーブ) と日本. 日本エイズ学会誌 12(2) :41-45, 2010年
 - 9)木原雅子. 若者の HIV 感染予防対策—複合予防としての WYSH プロジェクト. 日本臨床 68(3): 541-5、2010年
 - 10)木原雅子、加藤秀子、木原正博. 新時代の HIV 感染症予防戦略. 臨床とウイルス 38(4): 270-6, 2010年
 - 11)木原正博、木原雅子. 日本の HIV 流行の現状と推計・予測及び今後の展望について. 公衆衛生 74(11): 6-9、2010年
 - 12)木原雅子. 若者の性行動と性感染リスク. 臨床研修プラクティス 7(2) :72-73、2010年
 - 13)木原雅子、加藤秀子、木原正博. 単純予防から複合予防へ: 進化するエイズ/HIV 教育の現在. 健 (2009) 38(9): 22-27
 - 14)木原正博、西村由実子、木原雅子、樽井正義. アジア及び東アジアにおける HIV/AIDS 流行の現状と課題. 日本エイズ学会誌(2009) 11(2) : 67-71
 - 15)木原雅子、加藤秀子、木原正博. 若者の性行動の実態と性感染症リスク. Urology View (2009) 7(5): 18-22
 - 16)木原雅子、木原正博. エイズとその異性間感染の予防対策. 産婦人科治療 (2009) 99(2) : 141-145
 - 17)木原正博、森重裕子、小堀栄子、木原雅子. わが国の HIV/AIDS サーベイランスの現状と問題点. 日本性感染症学会誌 (2009) 20(1): 50-56
 - 18)木原正博、木原雅子. エイズと行動変容戦略—その現状と課題. 保健医療科学 (2009) 58(1): 26-32
 - 19)木原雅子、小堀栄子、西村由実子、森重裕子、木原正博. 性感染症の疫学—我が国の国際的特徴について. 日本臨床 (2009) 67(1): 16-22
 - 20)木原雅子. 現代社会と若者の性行動. 母子保健情報(2009) 60: 59-62

先進諸国における早期梅毒流行の再興とその背景要因について

The re-emergence of early syphilis epidemics in developed countries, and possible reasons

木原正博^{1),2)}

Masahiro KIHARA

木原雅子^{1),2)}

Masako ONO-KIHARA

西村由実子³⁾

Yumiko H. NISHIMURA

加藤秀子^{1),2)}

Hideko KATO

1997年以降、ほとんどの先進諸国において、同時多発的な早期梅毒のアウトブレイクが観察されるようになった。この流行には、感染者の大半（70～80%）が男性とセックスをする男性（MSM）であること、MSM症例中におけるHIV感染率が高い（約50%）ことなど、それ以前の梅毒流行とは全く異なる特徴があり、流行は、大都市の壮年～中年層のMSMが中心である。この流行には、HIV感染症に対する多剤併用療法の導入による予後改善や楽観論、エイズ予防キャンペーンの停滞やキャンペーンに対する無視や予防疲れ、インターネットによる性的ネットワークの拡大やレクリエーションドラッグ使用の蔓延など、以前とは異なる要因による無防備な性行動の復活が示唆されている。HIV流行と梅毒流行は相乗的に作用するため、HIV/性感染症予防対策の強化が急務である。

Since 1997, outbreaks of early syphilis began to occur simultaneously in most developed countries. In contrast to previous syphilis epidemics, the majority (70%) of the patients are men who have sex with men (MSM), and approximately half of the MSM patients are HIV positive. The epidemics are concentrated in young and middle-aged MSM living in large cities. Possible reasons for these outbreaks include improved prognosis and optimism created by the introduction of highly active antiretroviral therapy (HAART), decreased AIDS prevention campaigns, and neglect of prevention campaigns. Prevention fatigue, emergence of novel sexual networks created through the Internet, and the increased use of recreational drugs, all interacted to initiate the re-emergence of unprotected sexual behaviors. In view of the epidemiological synergism between HIV epidemics and syphilis epidemics, HIV/STI prevention efforts should urgently be intensified.

Key words : Early syphilis, Outbreak, MSM, HIV infection, Synergism

1. はじめに

梅毒は、最も古くから知られている性感染症（STI）の1つであり、第二次世界大戦以前は、欧米先進国でも猛威

をふるい、その合併症や先天梅毒は大きな社会的脅威となっていた。しかし、1940年代におけるペニシリン療法の実用化以降、流行は激減し、1990年代の終わりまでには、ほとんどの先進国で流行はほぼ終息し、その根

1) 京都大学大学院医学研究科社会健康医学系専攻社会疫学分野：Department of Global Health and Socio-epidemiology Kyoto University School of Public Health

2) 国連合同エイズ計画共同センター：UNAIDS Collaborating Centre for Socio-epidemiological HIV Research, Department of Nursing Science

3) 関西看護医療大学看護学部：Kansai University of Nursing and Health Sciences

2010(平成22)年9月17日受付、同12月10日掲載決定

(〒606-8501)京都市左京区吉田近衛町 京都大学大学院医学研究科教授・社会疫学 木原正博

絶は時間の問題とさえ考えられるまでになっていた。例えば、米国の疾病管理予防センター(CDC)は、1999年に National Plan to Eliminate Syphilis を打ち出し、国家目標(年間発生率<2.2/10万)と行動計画を定めてその根絶に乗り出した²⁾。しかし、皮肉なことに、米国ではその前年から、早期梅毒(1期、2期梅毒と早期潜伏梅毒)のアウトブレイクが相次ぎ³⁾、他の先進国でも一斉に同様の現象が報告されるようになった³⁾。こうした梅毒流行の再興は、同時並行して生じた HIV 流行との関連から、その動向と背景に大きな注目が集まっている。

本稿では、1990年1月1日から2010年6月30日までの関連文献をPubMedで網羅的にレビューし(検索ワード=syphilis, epidemic)、最近の欧米先進国における早期梅毒流行の特徴と背景、HIV流行における意義を紹介するとともに、その観点からわが国の最近の梅毒報告数増加の意味を考察する。

2. 1980年代から2000年代にかけての早期梅毒流行の変化

梅毒流行は、西欧諸国と米国でほぼ同様の経過を示し、いずれも第二次世界大戦後の10年間に激減したが、その後、1960年代から1980年代にかけて徐々に増加したのち、HIV流行の出現に伴って再び急減し、1990年代の終わりにほぼ底を打った(図1)。米国では、図1aに示すように、1960年代から1980年代にかけて、振動するように流行が増減を繰り返したため³⁾、この振動

は、集団中の免疫レベルの変化による自然変動であるとの理論も出され⁴⁾、数学モデルが作成されたりもしたが、現在ではそれは否定され、これは、少なくとも1980年代以降は、異なる地域や集団において次々に発生したアウトブレイクによることが示唆されている³⁾。例えば、1982年をピークとする流行は、南部における男性とセックスをする男性(Men who have a sex with men; 以下MSM)を主とする流行であり、1990年をピークとする流行は、大都市と南部の郡部におけるアフリカ系アメリカ人男女を中心とする異性間の流行で、クラックと呼ばれるコカイン使用の蔓延や売春がその背景となつたと推定されている。

このように、もはや終息するかと思われるまでに減少した梅毒流行であったが、1990年代後半には、大都市を中心に、アウトブレイクが報告されるようになった。西欧における最初の報告は、1997年の英国のBristol⁵⁾で、その後、デンマーク、ベルギー、オーストリア、アイルランド、ドイツ、フランス、オランダなどの大都市で、次々とアウトブレイクが報告され⁶⁾、米国では、シアトル州のKings Countyにおける報告(1998年)を皮切りに⁸⁾、西部と北東部の州の大都市を中心に、アウトブレイクが同時多発的に報告されていった(図2)⁹⁾。カナダ⁹⁾、オーストラリア¹⁰⁾、ニュージーランド¹¹⁾でも、西欧諸国と同様のアウトブレイクの多発が観察されている。注目すべきことは、これらの流行は1997年から4~5年以内という短期間に、先進諸国でほぼ同時に発生したこと、そして、それと並行して、HIV流行の再興が生じたことである⁹⁾。

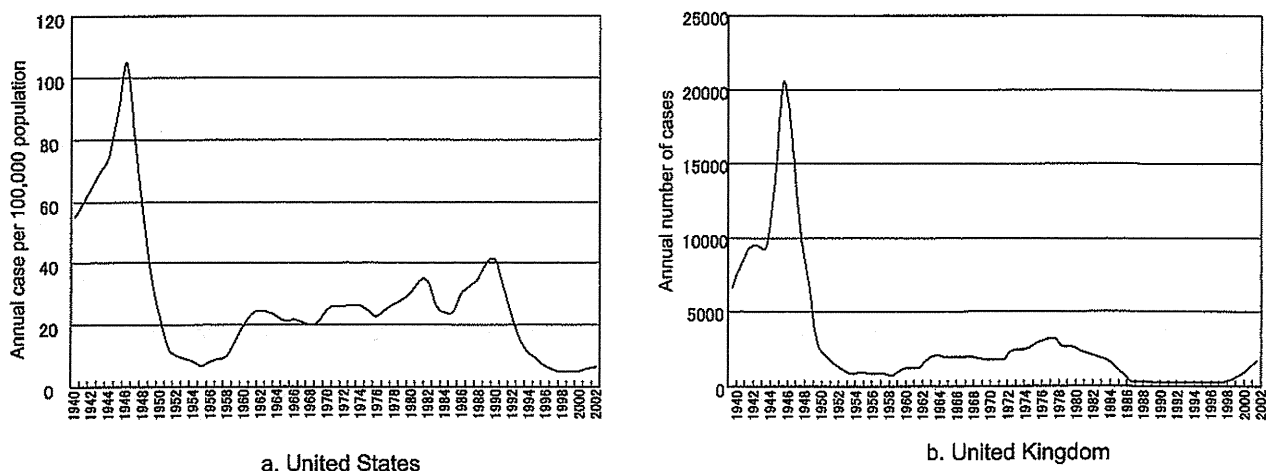


図1 Temporal trends in early syphilis in the United States and United Kingdom

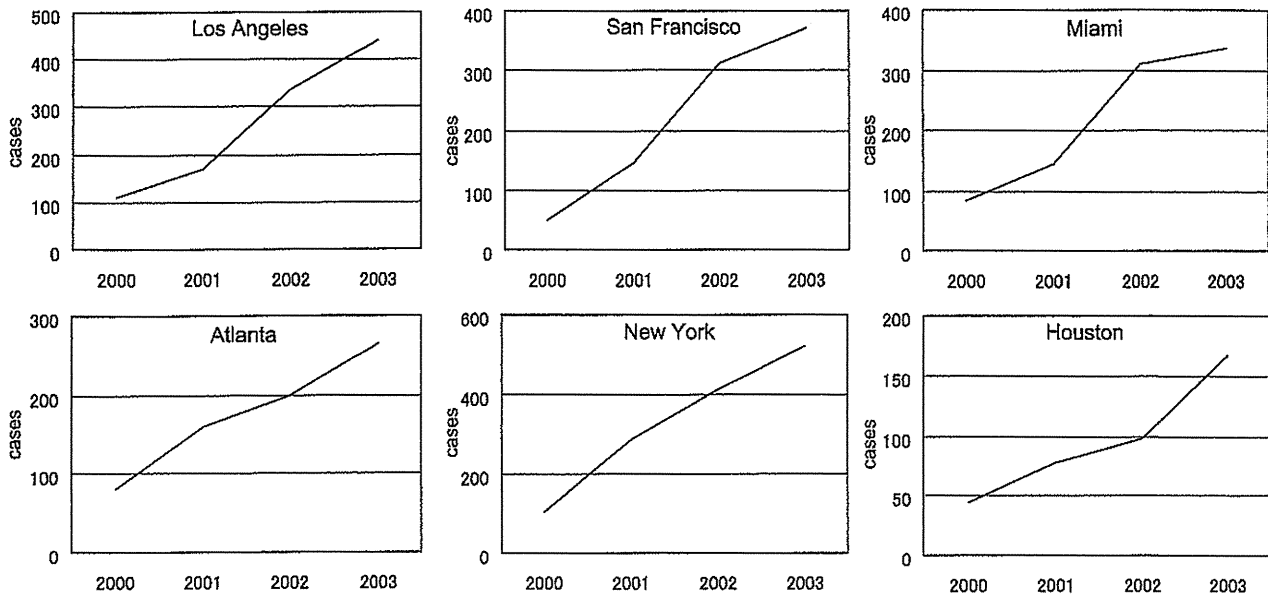


図2 Incidence of early syphilis in men in 6 US cities, 2000-2003

3. 梅毒流行の特徴について

最近の早期梅毒流行には、二つの非常に重要な特徴が見られる。その第一は、白人の MSM を中心とする流行であること、第二は、HIV の共感染率が非常に高いことである。その直前までの梅毒流行が、例えば、西欧では、移民もしくは海外で感染して帰国した人々における異性間感染、米国では、先述したように南部や大都市のアフリカ系アメリカ人における異性間感染であったことを考えれば、感染経路も集団も全く異なる流行が突如出現したことになる。

表 1 は、主要な国について、代表的なデータをまとめたものである^{6),9),12)-16)}。状況は相互に酷似しており、早期梅毒感染者に占める MSM の割合は 70~90%と高く、また MSM 中の HIV 感染者の割合は 50%前後と、MSM 以外の早期梅毒感染者における HIV 感染率を大きく上回っている。

これ以外の特徴として指摘されているのは、年齢である。それまでの流行が、20 歳代を中心としていたのに対して、最近では、30 歳代から 40 歳代前半が中心で、年齢の上昇が認められている。また、感染した場所については、例えば西欧諸国の以前の異性間感染では、移民や海外旅行という国際的な人の移動の重要性が指摘されていたが、現在の梅毒流行は、70%近くが国内感染である

とされている¹⁷⁾。

つまり、1997 年以降、先進諸国において、梅毒流行が同時多発的に発生したが、それは大都市における壮年~中年層の MSM を中心とする流行であり、かつ HIV 感染と強い関連あるという特徴がみられるということである。

4. 流行の背景要因について

ではこうした早期梅毒の流行はどのような背景で生じたのだろうか？ 以下それについて文献に基づいて考察する。本総説はテーマを梅毒に限定したものであり、かつ現時点の梅毒流行が MSM にほぼ限局しているため、以下の議論は MSM を中心としたものとなるが、一部を除き、多くの論点が、MSM 以外の集団にも当てはまることに注意が必要である。

1) MSM における性行動の変化

梅毒流行の背景にあるのは、言うまでもなく、MSM における性行動の変化である。欧米では、1990 年代の後半に MSM の間でリスクの高い性行動（コンドーム不使用、相手の多数化、不特定の相手との性交）が増加したことを示す論文が数多く報告されている¹⁸⁾⁻²⁰⁾。例えば、米国のサンフランシスコの STOP AIDS PROJECT にお

ける大規模横断調査では、多数の相手と無防備な肛門性交をする MSM の割合が、1994 年から 1997 年にかけて、23.6%から 33.3%と大きく増加したこと、増加率は 25 歳以下の若年層で特に大きかったことが観察されている²¹⁾。オーストラリアのシドニーの大規模調査でも、不特定の相手との無防備な性行動が、1996 年から 2000 年にかけて、HIV に感染した MSM では、35%から 46%に、HIV に感染していない MSM でも、16%から 27%に増加し、HIV 感染の有無にかかわらず、性行動の無防備化が進んだことが観察されている²²⁾。

2) エイズ予防キャンペーンの影響

1980 年代のエイズ流行の勃発は、それに伴う予防キャンペーンの集中的増加をもたらしたが、それが性行動の強い抑止力となって、梅毒を含めた STI 全般の大きな減少をもたらすことになった²³⁾。しかし、1990 年代後半にはキャンペーン自体が低調化したこと²⁴⁾、また、セーフセックスメッセージを無視する傾向が強まったこと²⁵⁾⁻²⁸⁾、あるいは、prevention fatigue (予防疲れ) と呼ばれる、予防行動を持続することへの疲れが生じたこと²⁹⁾、その抑止力が弱まり、それがリスクの高い性行動の復活につながったと考察されている。

さらに、エイズ予防キャンペーンは、予期しない形で STI の流行に寄与することになった。それは、エイズ予防の上では相対的に安全とされたオーラルセックスの蔓延

である。オーラルセックスは、エイズ流行と並行して増加し、例えば、2000 年の英国における全国調査(NAT-SAL2000)では、男女の約 80%がオーラルセックスを経験したと報告されている³⁰⁾。オーラルセックスは、HIV 流行には抑制的に働くが、ほとんどの STI は口腔感染するため、「口腔-性器」感染による STI 流行が生じたと考えられている。実際、最近の梅毒流行では、多くの国で、オーラルセックスの役割の重要性が指摘されている^{21),31)}。例えば、2000 年から 2002 年にかけて行われたシカゴの調査では、MSM の早期梅毒患者 325 人のうち、オーラルセックスだけが感染経路と思われる症例が 20%と報告されており³²⁾、2001 年から 2002 年にかけてのロンドンの調査では、それが 52% (44/103) にも上ることが報告されている³³⁾。オーラルセックスについては、わが国においても非常に一般的な性行動になったこと、かつ STI 感染の重要なリスク要因であることが報告されている^{34),35)}。

また、エイズ流行によって生じた sero-sorting (感染選択)あるいは negotiated safety (交渉による安全確保) と呼ばれる性行動も、早期梅毒流行の背景の 1 つとして指摘されている³⁶⁾。これは、HIV 陽性者は陽性者と、HIV 陰性者は陰性者と選択的に性行動を行う傾向のことを意味し、HIV 予防の現実的戦略として生じた行動である。しかし、この行動は、HIV 感染には予防的に働くものの、無防備な性行動を伴うため、STI の流行を予防すること

表 1 Proportions of men who have sex with men (MSM) among early syphilis case and HIV positives among MSM patients in developed countries

| Country (City) | Year of study | Number of patients | MSM (%) | HIV positives among MSM patients (%) | HIV positives among non-MSM patients (%) |
|---|---------------|--------------------|---------|--------------------------------------|--|
| United Kingdom (London) ⁶⁾ | 2001 | 1222 | 68% | 47% | 5% |
| France ¹²⁾ | 2000-2003 | 1080 | 84% | 53% | 11% |
| Germany ¹³⁾ | 2003 | 2932 | 76% | 50% | — |
| Canada (Ottawa) ⁹⁾ | 2001-2006 | 102 | 84% | 48% | 21% |
| Australia (Victoria) ¹⁵⁾ | 2004 | 85 | 74% | 40% | — |
| US (San Francisco, Los Angeles, Atlanta) ¹⁶⁾ | 2004-2005 | 455 | 80% | 47% | 17% |

*MSM=men who have sex with men

はできない。それに、多剤併用療法による HIV 感染者の予後改善効果が加わり、もともと行動リスクの高かった HIV 感染者の間では STI が蔓延することとなった。これが、梅毒と HIV 感染の共感染率が非常に高いこと(表 1)の背景と考えられている。HIV 検査が非常に進んだ地域(例: サンフランシスコでは、MSM の HIV 検査率は 90%以上)では、sero-sorting が高い確率で可能であるため、HIV 感染の発生は増加せず、STI だけが增加するという現象が生じたが³⁶⁾、MSM の検査率がそれほど高くない地域では、sero-sorting が成立しにくいいため、STI 感染と HIV 感染が同時に生じるという現象が生じている。

3) 多剤併用療法の影響について

1996 年に導入された多剤併用療法 (highly active antiretroviral therapy ; 以下 HAART)は、HIV 感染者の予後に大きな影響を与え、例えば、デンマークの研究では、25 歳の感染者は 40 年近くの生存が可能になったとされている³⁷⁾。しかし、HAART は、単に生存期間を延長しただけではなく、社会復帰が可能となるほど感染者の健康状態を回復し、先進諸国では、エイズをめぐる状況は一変した。しかし、一方で、無防備な性行動が消失したわけではないため^{38),39)}、HAART の受療と STI リスクの上昇との関連を示す報告がみられるようになった。例えば、1995 年から 1999 年という HAART の受療者と非受療者が混在する時期にサンフランシスコで行われたケースコントロール研究では、HAART 受療者の STI 感染リスクは非受療者の 4 倍も高いと報告され⁴⁰⁾、アムステルダムでの STD クリニックで 6103 人の MSM 受診者を対象に行われた研究では、HAART 導入後の梅毒感染リスクが HAART 導入前に比べ、3.4 倍高まったと報告されている⁴¹⁾。理論的に、感染症の伝播は、三つの要素、つまり、① 1 回の性交での感染確率 (β)、②ある単位期間中のパートナー数 (r)、③感染性のある時間 (D) によって決定される⁴²⁾。したがって、仮に HIV 感染者の性行動に全く変化がなくとも、治療によって生存期間 (D) が延長すれば、伝播が生じやすくなり、STI の流行が促進されることになる。逆に、生存期間 (D) が短ければ、伝播は抑制されるが、実際、HAART 導入直前までの梅毒流行の急減には、HIV 感染者の生存期間の短さが影響していたことが示唆されている^{43),44)}。また、HAART は、HIV 感染への楽観意識 optimism (抗 HIV 治療に

よって感染性 infectivity が低下するという意識)を生じ、それが梅毒流行の背景の一つとなったことが指摘されている^{22),29)}。

4) インターネットの影響について

インターネットは、匿名に近い環境を提供することにより、MSM がパートナーを探す重要な場となったことが指摘されている^{45),46)}。そして、インターネットは、これまで地理的に制限されてきた性的ネットワークを拡大し、新たな性的ネットワークを作り出すことになり、これが最近の多地域での同時多発的な梅毒のアウトブレイクの背景にあることが示唆されている^{2),3)}。そうしたインターネット使用と梅毒感染を示唆する報告も多く、例えば、サンフランシスコでは、MSM の早期梅毒患者の中で、インターネットを介して相手を見つけたと答えた人は、2000 年には、12.2%であったものが、2002 年には 32.6%、2003 年には 44.4%に増加したことが報告されている⁴⁷⁾。

5) リクリエーションドラッグやパイアグラの影響について

1990 年代前半までの梅毒流行は、コカイン (クラック)使用の蔓延と関連していることが指摘されていたが、最近の流行には、合成麻薬であるメタンフェタミンなど、いわゆるリクリエーションドラッグ (パーティドラッグ)と呼ばれる薬物やパイアグラとの関連が報告されている。例えば、サンフランシスコの公的 STD クリニックの MSM 患者を対象とした研究では、メタンフェタミン単独使用で梅毒感染リスクが 3.2 倍高まること、パイアグラと併用する場合には、6.2 倍と相乗的に高まることが指摘されている⁴⁸⁾。これは、こうした薬物の使用が、無防備な性行動を促進するためであり^{49),50)}、わが国でも、日高らによって、メタンフェタミンなどの薬物を使用する MSM における性行動は、使用しない MSM よりも性行動が非常に活発で無防備であることが報告されている⁵¹⁾。

以上をまとめると、先進諸国で最近同時多発的に生じた MSM 間での梅毒流行は、HAART 導入による予後改善や楽観論、エイズ予防キャンペーンの停滞やキャンペーンに対する無視や予防疲れ、インターネットによる性的ネットワークの拡大やレクリエーションドラッグ

使用の蔓延などによる無防備な性行動の復活によって発生したものと考えられる。

5. 最後に

図3に示すように、わが国においても、2002～2003年以降、男性の早期梅毒罹患患者報告数の増加が観察されており、2004年から2007年にかけての増加は、31%に上る(358→470)⁵³⁾(注：女性でも増加傾向にあり、他の国でも同じ動向が報告されているが¹⁷⁾、症例が少なく、その原因については詳しい分析は行われていないため、以下男性に議論を限定する)。興味深いことに、この梅毒の増加は、他のSTIとは正反対の動向を示しており、クラミジアや淋菌感染が2002年をピークに減少に転じているのに対し、梅毒は2002～2003年を底として増加に転じている。これは、クラミジアや淋菌感染の流行と梅毒の流行がそれぞれ異なる集団に発生していることを意味しており、クラミジア、淋菌感染が主として異性間感染であることを考えれば、この梅毒増加は、欧米社会と同じように、MSMにおいて生じていることを強く示唆するものとなっている。事実、最近の報告によ

れば、わが国のHIV診療医療機関でも、MSMのHIV感染者の34.4%に梅毒の既往もしくは新規感染があることが観察されており⁵³⁾、MSMにおける梅毒感染の蔓延が示唆されている。梅毒自体は報告件数は少ないが、現在の梅毒流行が、MSMにおける行動変化の「兆候」である可能性があること、また、最近の梅毒感染では、性器感染であっても無症状の場合が少なくないこと^{54),55)}、また、口腔感染は多くの場合無症候であることから³²⁾、報告数の増加は氷山の一角であることを認識することが重要である。

また、梅毒が、HIV流行の促進要因となる可能性についても注意が必要である。梅毒に感染すると、局部に炎症や潰瘍が生じることによって、HIVに数倍感染しやすくなることはよく知られているが⁵⁶⁾、HIV感染に梅毒が合併すると、CD4リンパ球の減少や血中ウイルス量の増加が生じることが明らかにされており⁵⁷⁾、そのためにHIV感染を他に移しやすくなってしまふ。また、HIV感染者においては、梅毒が神経梅毒に進展する速度が速いことも知られている⁵⁸⁾。つまり、梅毒流行とHIV流行の間には相互作用があり、お互いの流行を促進するだけでなく、お互いの症状の悪化につながる(注：これを疫

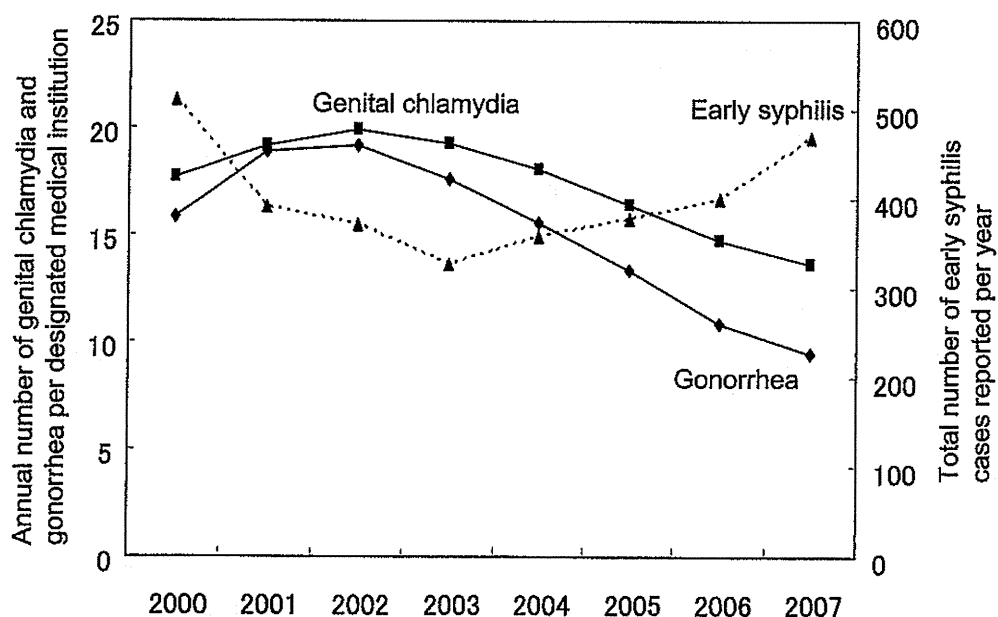


図3 Incidence of genital chlamydia, gonorrhea, and early syphilis in men in Japan, 2000-2007.
 Note: Number of male early syphilis patients in 2000-2003 were calculated multiplying 0.72, an average proportion of male in 2004-2007, to the total number of early syphilis in 2000-2003.

学的相乗作用 epidemiologic synergy と言う) という重要な関連が存在する。

よく知られているように、わが国においては、HIV 感染者報告数が増加を続け、その中で MSM が大半(2009 年で 68%) を占めている⁵⁹⁾。そうした状況において、梅毒が流行し始めたことの意味は非常に重要であり、MSM を対象とした予防対策の一層の強化が求められている。

謝 辞

本研究は、平成 22 年度厚生労働科学研究費補助金エイズ対策研究事業の補助を受けて実施した。

文 献

- 1) The National Plan to Eliminate Syphilis From the United States. Atlanta, Ga: National Center for HIV, STD, and TB Prevention, Centers for Disease Control and Prevention; 1999.
- 2) Peterman, TA, Heffelfinger, JD, Swint, EB, Groseclose, SL: The changing epidemiology of syphilis. *Sex Transm Dis.* 2005; 32(10 Suppl): S4-10.
- 3) Fenton, KA, Breban, R, Vardavas, R, Okano, JT, Martin, T, Aral, S, et al.: Infectious syphilis in high-income settings in the 21st century. *Lancet Infect Dis.* 2008; 8(4): 244-53.
- 4) Grassly, NC, Fraser, C, Garnett, GP: Host immunity and synchronized epidemics of syphilis across the United States. *Nature.* 2005; 433(7024): 417-421.
- 5) Battu, VR, Horner, PJ, Taylor, PK, Jephcott, AE, Egglestone, SI: Locally acquired heterosexual outbreak of syphilis in Bristol. *Lancet.* 1997; 350(9084): 1100-1101.
- 6) Simms, I, Fenton, KA, Ashton, M, Turner, KM, Crawley-Boevey, EE, Gorton, R, et al.: The re-emergence of syphilis in the United Kingdom: the new epidemic phases. *Sex Transm Dis.* 2005; 32(4): 220-226.
- 7) Fenton, KA, Lowndes, CM: Recent trends in the epidemiology of sexually transmitted infections in the European Union. *Sex Transm Infect.* 2004; 80(4): 255-263.
- 8) Williams, LA, Klausner, JD, Whittington, WL, Handsfield, HH, Celum, C, Holmes, KK: Elimination and reintroduction of primary and secondary syphilis. *Am J Public Health.* 1999; 89(7): 1093-1097.
- 9) Leber, A, MacPherson, P, Lee, BC: Epidemiology of infectious syphilis in Ottawa. Recurring themes revisited. *Can J Public Health.* 2008; 99(5): 401-405.
- 10) Jin, F, Prestage, GP, Kippax, SC, Pell, CM, Donovan, BJ, Kaldor, JM, et al.: Epidemic syphilis among homosexually active men in Sydney. *Med J Aust.* 2005; 183(4): 179-183.
- 11) Azariah, S: Is syphilis resurgent in New Zealand in the 21st century? A case series of infectious syphilis presenting to the Auckland Sexual Health Service. *NZ Med J.* 2005; 118(1211): U1349.
- 12) Couturier, E, Michel, A, Janier, M, Dupin, N, Semaille, C: Syphilis surveillance network. Syphilis surveillance in France, 2000-2003. *Euro Surveill.* 2004; 9(12): 8-10.
- 13) Marcus, U, Bremer, V, Hamouda, O: Syphilis surveillance and trends of the syphilis epidemic in Germany since the mid-90s. *Euro Surveill.* 2004; 9(12): 11-14.
- 14) Botham, SJ, Ressler, KA, Bourne, C, Ferson, MJ: Epidemic infectious syphilis in inner Sydney--strengthening enhanced surveillance. *Aust NZJ Public Health.* 2006; 30(6): 529-533.
- 15) Guy, RJ, Leslie, DE, Simpson, K, Hatch, B, Leydon, J, Hellard, ME, et al.: Sustained increase in infectious syphilis notifications in Victoria. *Med J Aust.* 2005; 183(4): 218.
- 16) Buchacz, K, Klausner, JD, Kerndt, PR, Shouse, RL, Onorato, I, McElroy, PD, et al.: HIV incidence among men diagnosed with early syphilis in Atlanta, San Francisco, and Los Angeles, 2004 to 2005. *J Acquir Immune Defic Syndr.* 2008; 47(2): 234-240.
- 17) Velicko, I, Arneborn, M, Blaxhult, A: Syphilis epidemiology in Sweden: re-emergence since 2000 primarily due to spread among men who have sex with men. *Euro Surveill.* 2008; 13(50). pii: 19063.

- 18) Dodds, JP, Mercey, DE, Parry, JV, Johnson, AM: Increasing risk behaviour and high levels of undiagnosed HIV infection in a community sample of homosexual men. *Sex Transm Infect.* 2004; 80(3): 236-240.
- 19) Stolte, IG, Dukers, NH, Geskus, RB, Coutinho, RA, de Wit, JB: Homosexual men change to risky sex when perceiving less threat of HIV/AIDS since availability of highly active antiretroviral therapy: a longitudinal study. *AIDS.* 2004; 18(2): 303-309.
- 20) Elford, J: Changing patterns of sexual behaviour in the era of highly active antiretroviral therapy. *Curr Opin Infect Dis.* 2006; 19(1): 26-32.
- 21) Centers for Disease Control and Prevention (CDC). Increases in unsafe sex and rectal gonorrhoea among men who have sex with men--San Francisco, California, 1994-1997. *MMWR Morb Mortal Wkly Rep.* 1999; 48(3): 45-48.
- 22) Van de Ven, P, Prestage, G, Crawford, J, Grulich, A, Kippax, S: Sexual risk behaviour increases and is associated with HIV optimism among HIV-negative and HIV-positive gay men in Sydney over the 4 year period to February 2000. *AIDS.* 2000; 14(18): 2951-2953.
- 23) WHO Regional Office for Europe. Trends in sexually transmitted infections and HIV in the European Region, 1980-2005. Technical briefing document O1B/O6, 2006. Available from <http://www.smittskyddsinstitutet.se/upload/EPI-aktuellt-ny/2007>
- 24) Nicoll, A, Hughes, G, Donnelly, M, Livingstone, S, De Angelis, D, Fenton, K, et al.: Assessing the impact of national anti-HIV sexual health campaigns: trends in the transmission of HIV and other sexually transmitted infections in England. *Sex Transm Infect.* 2001; 77(4): 242-247.
- 25) Gold, RS, Skinner, MJ: Situational factors and thought processes associated with unprotected intercourse in young gay men. *AIDS.* 1992; 6: 1021-1030.
- 26) Ekstrand, ML, Stall, RD, Paul, JP, Osmond, DH, Coates, TJ: Gay men report high rates of unprotected anal sex with partners of unknown or discordant HIV status. *AIDS.* 1999; 13: 1525-1533.
- 27) Waldo, CR, McFarland, W, Katz, MH, MacKellar, D, Valleroy, LA: Very young gay and bisexual men are at risk for HIV infection: the San Francisco Bay Area Young Men's Survey II. *J Acquir Immune Defic Syndr.* 2000; 24: 168-174.
- 28) Wolitski, RJ, Valdeserri, RO, Denning, PH, Levine, WC: Are we headed for a resurgence of the HIV epidemic among men who have sex with men? *Am J Public Health.* 2001; 91: 883-888.
- 29) Adam, BD, Husbands, W, Murray, J, Maxwell, J: AIDS optimism, condom fatigue, or self-esteem? Explaining unsafe sex among gay and bisexual men. *J Sex Res.* 2005; 42(3): 238-248.
- 30) Johnson, AM, Mercer, CH, Erens, B, Copas, AJ, McManus, S, Wellings, K, et al.: Sexual behaviour in Britain: partnerships, practices, and HIV risk behaviours. *Lancet.* 2001; 358(9296): 1835-1842.
- 31) Savage, EJ, Hughes, G, Ison, C, Lowndes, CM: European Surveillance of Sexually Transmitted Infections network. Syphilis and gonorrhoea in men who have sex with men: a European overview. *Euro Surveill.* 2009; 14(47). pii: 19417.
- 32) Centers for Disease Control and Prevention (CDC). Transmission of primary and secondary syphilis by oral sex--Chicago, Illinois, 1998-2002. *MMWR Morb Mortal Wkly Rep.* 2004; 53(41): 966-968.
- 33) Hourihan, M, Wheeler, H, Houghton, R, Goh, BT: Lessons from the syphilis outbreak in homosexual men in east London. *Sex Transm Infect.* 2004; 80(6): 509-511.
- 34) Homma, T, Ono-Kihara, M, Zamani, S, Nishimura, YH, Kobori, E, Hidaka, Y, et al.: Demographic and behavioral characteristics of male sexually transmitted disease patients in Japan: a nationwide case-control study. *Sex Transm Dis.* 2008; 35(12): 990-996.
- 35) Ono-Kihara, M, Sato, T, Kato, H, Suguimoto-Watanabe, SP, Zamani, S, Kihara, M: Demographic and behavioral characteristics of non-sex worker females attending sexually transmitted disease clinics

- in Japan : a nationwide case-control study. *BMC Public Health*. 2010 ; 10 : 106.
- 36) Truong, HM, Kellogg, T, Klausner, JD, Katz, MH, Dilley, J, Knapper, K, et al. : Increases in sexually transmitted infections and sexual risk behaviour without a concurrent increase in HIV incidence among men who have sex with men in San Francisco : a suggestion of HIV serosorting? *Sex Transm Infect*. 2006 ; 82(6) : 461-466.
- 37) Lohse, N, Hansen, AB, Pedersen, G, Kronborg, G, Gerstoft, J, Sørensen, HT, et al. : Survival of persons with and without HIV infection in Denmark, 1995-2005. *Ann Intern Med*. 2007 ; 146(2) : 87-95.
- 38) Crepaz, N, Hart, TA, Marks, G : Highly active antiretroviral therapy and sexual risk behavior : a meta-analytic review. *JAMA*. 2004 ; 292(2) : 224-236.
- 39) Miller, M, Meyer, L, Boufassa, F, Persoz, A, Sarr, A, Robain, M, et al. : Sexual behavior changes and protease inhibitor therapy. SEROCO Study Group. *AIDS*. 2000 ; 14(4) : F33-39.
- 40) Scheer, S, Chu, PL, Klausner, JD, Katz, MH, Schwarcz, SK. *Lancet*. 2001 ; 357(9254) : 432-435. Effect of highly active antiretroviral therapy on diagnoses of sexually transmitted diseases in people with AIDS.
- 41) Stolte, IG, Dukers, NH, de Wit, JB, Fennema, JS, Coutinho, RA : Increase in sexually transmitted infections among homosexual men in Amsterdam in relation to HAART. *Sex Transm Infect*. 2001 ; 77(3) : 184-186.
- 42) Anderson, RM. Transmission dynamics of sexually transmitted infections. In : Holms KK, Sparling PF, Mardth P-A et al. editors. *Sexually Transmitted Diseases*. 3rd Ed. New York : McGraw-Hill ; 1999. p.25-37.
- 43) Chesson, HW, Dee, TS, Araf, SO : AIDS mortality may have contributed to the decline in syphilis rates in the United States in the 1990s. *Sex Transm Dis*. 2003 ; 30(5) : 419-424.
- 44) Chesson, HW, Gift, TL : Decreases in AIDS mortality and increases in primary and secondary syphilis in men who have sex with men in the United States. *J Acquir Immune Defic Syndr*. 2008 ; 47(2) : 263-264.
- 45) Kim, AA, Kent, C, McFarland, W, Klausner, JD : Cruising on the Internet highway. *J Acquir Immune Defic Syndr*. 2001 ; 28(1) : 89-93.
- 46) Mettey, A, Crosby, R, DiClemente, RJ, Holtgrave, DR : Associations between internet sex seeking and STI associated risk behaviours among men who have sex with men. *Sex Transm Infect*. 2003 ; 79(6) : 466-468.
- 47) Centers for Disease Control and Prevention (CDC). Internet use and early syphilis infection among men who have sex with men--San Francisco, California, 1999-2003. *MMWR Morb Mortal Wkly Rep*. 2003 ; 52(50) : 1229-1232.
- 48) Wong, W, Chaw, JK, Kent, CK, Klausner, JD : Risk factors for early syphilis among gay and bisexual men seen in an STD clinic : San Francisco, 2002-2003. *Sex Transm Dis*. 2005 ; 32(7) : 458-463.
- 49) Lee, SJ, Galanter, M, Dermatis, H, McDowell, D : Circuit parties and patterns of drug use in a subset of gay men. *J Addict Dis*. 2003 ; 22(4) : 47-60.
- 50) Chu, PL, McFarland, W, Gibson, S, Weide, D, Henne, J, Miller, P, et al. : Viagra use in a community-recruited sample of men who have sex with men, San Francisco. *J Acquir Immune Defic Syndr*. 2003 ; 33(2) : 191-193.
- 51) Hidaka, Y, Ichikawa, S, Koyano, J, Urao, M, Yasuo, T, Kimura, H, et al. : 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.
- 52) 国立感染症研究所感染症情報センター : 感染症動向調査. 1999-2007. <http://idsc.nih.go.jp/index-j.html>
- 53) 佐藤文哉, 河野真二, 加藤哲朗, 堀野哲也, 中澤 靖, 吉川晃司ほか : HIV 感染者の梅毒に関する検討. *日性感染症会誌*, 2009 ; 2(1) : 192-197.
- 54) Cohen, CE, Winston, A, Asboe, D, Boag, F, Mandalia, S, Azadian, B, et al. : Increasing detection of asymptomatic syphilis in HIV patients. *Sex Transm Infect*. 2005 ; 81(3) : 217-219.

- 55) Branger, J, van der Meer, JT, van Ketel, RJ, Jurriaans, S, Prins, JM : High incidence of asymptomatic syphilis in HIV-infected MSM justifies routine screening. *Sex Transm Dis.* 2009 ; 36(2) : 84-85.
- 56) Røttingen, JA, Cameron, DW, Garnett, GP : A systematic review of the epidemiologic interactions between classic sexually transmitted diseases and HIV : how much really is known? *Sex Transm Dis.* 2001 ; 28(10) : 579-597. Review.
- 57) Buchacz, K, Patel, P, Taylor, M, Kerndt, PR, Byers, RH, Holmberg, SD, et al. : Syphilis increases HIV viral load and decreases CD4 cell counts in HIV-infected patients with new syphilis infections. *AIDS.* 2004 ; 18(15) : 2075-2079.
- 58) Musher, DM, Hamill, RJ, Baughn, RE : Effect of human immunodeficiency virus (HIV) infection on the course of syphilis and on the response to treatment. *Ann Intern Med.* 1990 ; 113(11) : 872-881.
- 59) 厚生労働省エイズ動向委員会 : 平成 21 年エイズ発生動向年報. 東京, 2010.

Potential for Sexual Transmission of HIV Infection From Male Injecting-Drug Users Who Have Sex With Men in Tehran, Iran

Saman Zamani, MD, PHD,* Masako Ono-Kihara, PHD,* Seiichi Ichikawa, PHD,†
and Masahiro Kihara, MD, PHD*

Background: Iran faced an HIV epidemic among injecting-drug users (IDUs) and has responded to this threat. Meanwhile, there is growing concern over the possibility of bridging HIV infection from IDUs to other populations, including men who have sex with men (MSM).

Methods: Cross-sectional biobehavioral surveys were conducted among 370 injecting-drug users recruited from drug treatment centers, a drop-in center, as well as streets in drug-populated areas in Tehran, Iran, between 2003 and 2004.

Results: Data from these surveys showed that about 12% of male, sexually experienced IDUs have had same-gender sex, and HIV prevalence is high (19%), but condom use during the last sexual encounter was low (20%). A multivariate analysis showed that IDUs who had sex with men (MSM IDUs), compared to other sexually experienced IDUs, are younger (AOR, 0.89; 95% CI, 0.81–0.98), more likely to have used a shared needle/syringe for drug injection (AOR, 4.29; 95% CI, 1.82–10.12), and have had more than 5 sexual partners in their lifetime (AOR, 2.71; 95% CI, 1.14–6.44).

Conclusions: These results show that MSM IDUs exhibit more drug-related and sexual risk behaviors that may serve as a bridge for sexual transmission of HIV to other populations, including the broader MSM community, in Tehran. This report intends to encourage health authorities in Iran to take serious action to prevent sexual transmission of HIV from MSM IDUs to their sexual networks.

Iranian health authorities have responded to an HIV epidemic among injecting-drug users (IDUs) by adopting harm reduction policies and practices.¹ Although the coverage of these programs for drug users has not yet been evaluated, there is evidence showing a rapid increase in the availability of prevention interventions within prisons and among the broader community.^{2,3} Meanwhile, there is increasing concern over the

possibility that HIV infection can bridge from IDUs to the wider MSM community in Iran.

Bridging HIV transmission between MSM and IDU communities has been documented in other countries. It is believed that HIV infection bridged from MSM into IDUs in local areas of New York, Sydney, and Rio de Janeiro through MSM who were using injected drugs (MSM IDUs).^{4–7} In Manhattan, the earliest adult cases of AIDS were entirely among homosexual/bisexual men who were not IDUs; however, the first known cases among IDUs included a high proportion of homosexual/bisexual men.⁵ It has also been documented that HIV-1 B/C recombinants among MSM in Jiangsu, China, were introduced by IDUs.⁸

There is a dearth of knowledge regarding the health status of the MSM population in Iran. Furthermore, there is little information on whether HIV has entered this community. This brief review, taken from surveys completed by IDUs in Tehran, aims to highlight the potential for HIV bridging from infected MSM IDUs to other populations, including the wider MSM community. The data presented here are from the first 2 phases of the HADI Project (HIV/AIDS Prevention Study among Drug Users in Iran) conducted between 2003 and 2004. In particular, this article reports the proportion of IDUs who have had sex with other men and the prevalence of HIV-1 infection among them, and defines other HIV-related risk characteristics that are associated with a history of same-gender sex among IDUs in Tehran.

MATERIALS AND METHODS

Through the 2 chronological phases of this project, IDUs were recruited first from drug treatment centers, and then from a drop-in center and from the streets of areas of downtown Tehran with significant IDU populations. These individuals were asked to participate in HIV bio-behavioral surveys. The cumulative data from these 2 surveys are presented in this paper and more details can be found elsewhere.^{9–11} Briefly, between October 2003 and November 2004, IDUs were recruited at treatment centers and from the community to investigate the prevalence of and factors associated with HIV infection among them. After obtaining informed consent, each respondent was interviewed and asked about sociodemographics and drug- and sexual risk behaviors. Here, we have defined IDUs as individuals who had used illicit drugs by injection during their lifetime and MSM as males who had ever had sexual intercourse with a person of the same gender.

Oral mucosal transudate samples were then obtained from consenting participants using the OraSure oral fluid specimen collection device (OraSure Technologies, Inc., Beaverton, OR). All samples were tested in Japan for HIV-1 by an ELISA (Oral Fluid Vironostika HIV-1 MicroELISA System, Bi-

From the *Department of Global Health and Socio-epidemiology, Kyoto University School of Public Health, Kyoto, Japan; and †Department of Infection Control and Prevention, Nagoya City University, Nagoya, Japan

The authors thank the participants and the study team.

Supported by the Department of Global Health and Socio-epidemiology, at Kyoto University School of Public Health, Japan.

Correspondence: Saman Zamani, MD, PhD, Department of Global Health and Socio-epidemiology, Kyoto University School of Public Health, Yoshida-Konoe-cho, Sakyo-ku, Kyoto 606–8501, Japan. E-mail: saman.zamani@gmail.com or szamani@sph.mbox.media.kyoto-u.ac.jp.

Received for publication December 14, 2009, and accepted April 12, 2010.

DOI: 10.1097/OLQ.0b013e3181e2c73f

Copyright © 2010 American Sexually Transmitted Diseases Association

All rights reserved.

oMérieux Inc., Durham, NC) and repeatedly reactive ELISA samples were confirmed positive by Western blot (OraSure HIV-1 Western Blot Kit, OraSure Technologies, Inc., Bethlehem, PA).¹² Informed consent was obtained separately for the interview and HIV testing, and no personal identifiers were recorded on the questionnaires.

Statistical analyses were performed using SPSS for Windows (version 13). Student *t*, chi-squared, or Fisher exact tests were performed to determine bivariate associations between a history of same-gender sexual practice and continuous or categorical variables. Variables were entered into a multivariate model if their association with a history of same-gender sexual practice by bivariate analyses had a *P* value ≤ 0.10 . A multivariable logistic regression analysis was used to examine the associations between independent variables and outcome, simultaneously adjusting for potential confounders, and to estimate adjusted odds ratios (AORs) and 95% confidence intervals (CIs).

RESULTS

Between 2003 and 2004, 370 IDUs in Tehran participated in these 2 surveys. Among those interviewed, 307 (83%) reported having experienced sexual intercourse and were included in further analyses. The mean age of sexually experienced IDUs was 33.0 years and most (65%) were of Fars ethnicity. All professed belief in Islam and 70% had educational levels of junior high school or higher. Up to 58% had been or were married and 18% were homeless at the time of the interview (Table 1).

Table 1 shows HIV-related risk behaviors of the sexually experienced IDUs. The mean age at first drug injection was 26.1 year, with an average duration of drug injection of 6.4 years by the interview date. About 44% reported using a shared needle or syringe for drug injection and 80% had been incarcerated. About one-third reported that they had had greater than 5 sexual partners in their lifetime and the majority (86%) had had only non-IDU sexual partners. Over 38% had exchanged money or drugs for sex in their lifetime. Among all sexually experienced IDUs, 53% reported having ever used a condom during sexual intercourse. Meanwhile, consistent condom use was uncommon, as only 20% reported using a condom during their last sexual experience. Around 1 in 8 (12%) of the sexually experienced IDUs reported that they had had sex with another man during their lifetime. Up to 41% reported having had an HIV test before this study. Up to 19% (58/307) of the mucosal transudate specimens from IDUs were confirmed HIV-1 positive (Table 1).

A bivariate comparison of the MSM IDUs and other IDUs without a history of same-gender sex showed that both groups were comparable with regard to ethnic background, educational levels, living status and job situation. However, MSM IDUs were significantly younger than non-MSM IDUs (29 vs. 32 years old, respectively; *t*-test, *P* < 0.01) and a higher proportion of MSM IDUs had never married (65% vs. 38%, respectively; chi-squared, *P* < 0.01). MSM IDUs started drug injection at an earlier age than non-MSM IDUs (23 vs. 25 years old, respectively; *t*-test, *P* < 0.01). Whereas they reported a marginally shorter length of drug injection, a higher proportion of MSM IDUs had used a shared needle or syringe for drug injection in their lifetime compared to non-MSM IDUs (68% vs. 40%, respectively; chi-squared, *P* < 0.01). History of incarceration was comparable between the 2 groups.

Bivariate analyses showed that a higher proportion of MSM IDUs compared to non-MSM IDUs reported having had

more than 5 sexual partners in their lifetime (54% vs. 30%, respectively; chi-squared, *P* < 0.01). A history of exchanging money or drugs for sex was also reported by a higher proportion of MSM IDUs than other IDUs (56% vs. 36%, respectively; chi-squared, *P* < 0.05). However, rate of condom use during their last sexual encounter was low and comparable among MSM IDU and non-MSM IDU participants (24% vs. 19%, respectively). In both groups of IDUs, slightly over 40% of the participants reported having had at least one prior HIV test. Based on our HIV testing, there was no significant difference in the prevalence of HIV-1 infection between MSM IDUs and non-MSM IDUs (22% vs. 18.5%, respectively) (Table 1).

Three variables maintained a statistically significant difference after multivariate analysis. MSM IDUs, compared to other sexually experienced IDUs, were significantly younger (AOR, 0.89; 95% CI, 0.81–0.98; *P* < 0.05) and a higher proportion of them reported using a shared needle/syringe for drug injection (AOR, 4.29; 95% CI, 1.82–10.12; *P* < 0.01) or having had more than 5 sexual partners in their lifetime (AOR, 2.71; 95% CI, 1.14–6.44; *P* < 0.05).

DISCUSSION

Our study findings suggested that male IDUs in Tehran were mostly sexually experienced, had a high prevalence of HIV infection, and low rates of condom use. Within this group of IDUs, we identified a significant minority (12%) that had had sex with other men (MSM IDUs). MSM IDUs, who were significantly younger than non-MSM IDUs, reported more drug-related and sexual risk characteristics.

Investigating same-gender sexual behavior in Islamic countries such as Iran is a challenging task. Same-gender sex is still taboo in Iran and is punishable by law. Asking questions related to same-gender sex is also sensitive for drug-using individuals because of the additional embarrassment or fear of penalty because of their drug use. We thereby included a desensitizing explanation before asking the same-gender sexual experience question by stating that other people may have had similar experiences. Despite sensitivities regarding same-gender sexual practice, 12% of IDUs reported having had sex with another man in their lifetime, a proportion that may be an underestimate.

The multivariate comparison of MSM IDUs with those IDUs without a history of same-gender sex showed that a higher proportion of MSM IDUs reported sharing a needle/syringe for drug injection in their lifetime. Additionally, although MSM IDUs were significantly younger, they reported more lifetime sexual partners than other non-MSM, sexually experienced IDUs. Another worrisome finding was that condom use during their last sexual intercourse was low in both groups of IDUs. Our data also suggested that male IDUs were primarily involved in sexual relationships with people other than IDUs. Taken together, these findings suggest that MSM IDUs with their high HIV prevalence, low rate of condom use, and multiple sex partners in their lifetime serve as a potential bridge for HIV transmission to their sexual partners, who could be members of the broader MSM community and/or their heterosexual networks.

MSM IDUs in several other countries have been shown to be at greater risk of HIV infection.^{13–16} Based on our data, however, MSM IDUs in Tehran did not have a greater risk of HIV infection at the time of our investigation; our data showed that HIV prevalence among MSM IDUs was high (22%) but comparable to the prevalence among non-MSM IDUs (18.5%). Whereas this finding suggests no additional risk for HIV ac-

TABLE 1. Comparison of Sexually Active Male IDUs Who Have Had Sex With Men and Other IDUs Without Same-Gender Sexual Experience Recruited in Tehran, Iran, 2003–2004

| Characteristics | Total n | Non-MSM IDUs n (Column %) | MSM IDUs n (Column %) | P | Odds Ratio (95% CI) | |
|--|-------------------|---------------------------------|--------------------------|-------|-------------------------------|-------------------------------|
| | | | | | Crude | Adjusted* |
| Overall sexually active IDUs | 307 | 270 | 37 (12.1) | — | — | — |
| Mean age (SD) (median) | 33 (8.0) (32.0) | 33.6 (8.1) (32.0) | 28.7 (5.7) (29.0) | 0.001 | 0.91 (0.86–0.96) [†] | 0.89 (0.81–0.98) [†] |
| Ethnicity | | | | | | |
| Fars | 198 (64.5) | 174 (64.4) | 24 (64.9) | | Ref. | — |
| Others | 109 (35.5) | 96 (35.6) | 13 (35.1) | 0.96 | 0.98 (0.48–2.02) | — |
| Religion | | | | | | |
| Shia Islam | 301 (98.0) | 267 (98.9) | 34 (91.9) | | Ref. | Ref. |
| Sunni Islam | 6 (2.0) | 3 (1.1) | 3 (8.1) | 0.025 | 7.85 (1.52–40.47) | 8.30 (0.90–76.32) |
| Marital status | | | | | | |
| Single (never married) | 128 (41.7) | 104 (38.5) | 24 (64.9) | | Ref. | Ref. |
| Married and living with spouse | 92 (30.0) | 85 (31.5) | 7 (18.9) | 0.023 | 0.36 (0.15–0.87) | 0.89 (0.31–2.52) |
| Ever married but not living with spouse | 87 (28.3) | 81 (30.0) | 6 (16.2) | 0.018 | 0.32 (0.13–0.82) | 0.50 (0.15–1.59) |
| Living status | | | | | | |
| Not homeless | 251 (81.8) | 222 (82.2) | 29 (78.4) | | Ref. | — |
| Homeless | 56 (18.2) | 48 (17.8) | 8 (21.6) | 0.57 | 1.28 (0.55–2.96) | — |
| Mean age at first injection (SD) (median) | 26.1 (6.5) (25.0) | 26.5 (6.6) (25.0) | 23.3 (5.1) (23.0) | 0.007 | 0.91 (0.86–0.98) [†] | 1.02 (0.92–1.13) [†] |
| Mean length of lifetime drug injection (SD) (median) | 6.4 (5.9) (5.0) | 6.5 (6.1) (5.0) | 5.2 (4.1) (5.0) | 0.194 | 0.96 (0.89–1.02) [†] | — |
| Ever used a shared needle/syringe for drug injection | | | | | | |
| No | 170 (56.3) | 158 (59.6) | 12 (32.4) | | Ref. | Ref. |
| Yes | 132 (43.7) | 107 (40.4) | 25 (67.6) | 0.002 | 3.08 (1.48–6.39) | 4.29 (1.82–10.12) |
| No. lifetime sex partners | | | | | | |
| 1–5 | 183 (59.6) | 171 (63.3) | 12 (32.4) | | Ref. | Ref. |
| 6 or more | 100 (32.6) | 80 (29.6) | 20 (54.1) | 0.001 | 3.56 (1.67–7.64) | 2.71 (1.14–6.44) |
| Not reported | 24 (7.8) | 19 (7.0) | 5 (13.5) | 0.024 | — | — |
| Ever had sex with an IDU sex partner | | | | | | |
| No | 257 (86.0) | 225 (85.9) | 32 (86.5) | | Ref. | — |
| Yes | 42 (14.0) | 37 (14.1) | 5 (13.5) | 0.921 | 0.95 (0.35–2.60) | — |
| Ever exchanged money/drug for sex | | | | | | |
| No | 185 (61.7) | 169 (64.0) | 16 (44.4) | | Ref. | Ref. |
| Yes | 115 (38.3) | 95 (36.0) | 20 (55.6) | 0.023 | 2.22 (1.10–4.50) | 1.63 (0.73–3.65) |
| Ever used a condom for sexual intercourse | | | | | | |
| No | 144 (47.2) | 130 (48.5) | 14 (37.8) | | Ref. | — |
| Yes | 161 (52.8) | 138 (51.5) | 23 (62.2) | 0.223 | 1.55 (0.76–3.14) | — |
| Used condom for last sexual intercourse | | | | | | |
| No | 243 (80.2) | 215 (80.8) | 28 (75.7) | | Ref. | — |
| Yes | 60 (19.8) | 51 (19.2) | 9 (24.3) | 0.461 | 1.36 (0.60–3.05) | — |
| Ever been tested for HIV infection before this study | | | | | | |
| No | 181 (59.0) | 160 (59.3) | 21 (56.8) | | Ref. | — |
| Yes | 126 (41.0) | 110 (40.7) | 16 (43.2) | 0.772 | 1.11 (0.55–2.22) | — |
| Result of confirmatory HIV testing | | | | | | |
| Negative | 249 (81.1) | 220 (81.5) | 29 (78.4) | | Ref. | — |
| Positive | 58 (18.9) | 50 (18.5) | 8 (21.6) | 0.651 | 1.21 (0.52–2.81) | — |

*The variables in the multivariate analysis are also adjusted to the phase of the study.

[†]Continuous variable.

MSM indicates men who have sex with other men; IDU, injecting drug user; CI, confidence interval; SD, standard deviation; Ref, reference category.

quisition from sexual partners of MSM IDUs, it also suggests that the MSM IDU population in Tehran, with its high level of HIV infection, may act as a bridge for HIV transmission from IDUs to the MSM community.

Sexual risk reduction programs are crucial for preventing sexual transmission of HIV infection from sexually active IDUs to the broader population of Iran. Despite existing social barriers against homosexuality in Iran, governmental and non-governmental health authorities are encouraged to address the same-gender sexual practices of IDUs and begin identifying appropriate sexual risk reduction strategies. Sexual health services targeting MSM IDUs can be further integrated into a more comprehensive HIV prevention package for IDUs in Iran, incorporating components related to sexual orientation.

An increasing number of IDUs are visiting drop-in centers or voluntary HIV counseling and testing centers in Iran; such visits would be a good opportunity for health care providers to discuss concepts related to sexual orientation and how to reduce the risk of HIV acquisition/transmission between same-gender partners. Appropriate training of health care providers would be among the first steps necessary for comprehensive HIV prevention among the MSM community in Iran.

The general MSM community in Iran should also be made aware of the potential risk of HIV and other blood-borne infections and be encouraged to exhibit safer sex practices. Whereas HIV prevention interventions targeted at MSM IDUs and other MSM, including the promotion of consistent condom use and repeated HIV testing, are urgently needed, any plan targeting the MSM community in Iran should be supportive in nature and sensitive to the current context of the country, avoiding further stigma associated with same-gender sexual activity.

Some limitations of this study should be noted. Although the research team made efforts to help participants feel comfortable and share their thoughts and experiences, social desirability remains a potential source of bias in responding to survey questions,¹⁷ especially in research involving behaviors that are illegal. We recruited participants from treatment and drop-in centers and through outreach activities in downtown Tehran; therefore, our findings may not be representative of the wider IDU community. Further research is definitely needed to explore cultural context in regard to homosexuality in Iran, as well as opportunities for HIV prevention among MSM IDUs and among the wider noninjecting MSM population in Iran.

In conclusion, these results indicate that IDUs in Tehran who are MSM are at a higher risk of contracting blood-borne infections and that they may act as a bridge for sexual transmission of HIV to other populations, including the broader non-IDU MSM community and/or their heterosexual networks. Health authorities in Iran, who have already shown their strength in preventing and controlling HIV infection among IDUs, are encouraged to take swift action now to prevent further spread of HIV infection among the MSM population before the infection reaches epidemic proportions.

REFERENCES

1. Razzaghi E, Nassirimanesh B, Afshar P, et al. HIV/AIDS harm reduction in Iran. *Lancet* 2006; 368:434–435.
2. Health And Treatment Headquarter Of Iran Prison Organization. An overview on HIV/AIDS in prisons of Islamic Republic of Iran. Tehran, Iran: Iran Prison Organization, 2006.
3. UNAIDS. Islamic Republic of Iran Country Report on Monitoring of the United Nations General Assembly Special Session on HIV and AIDS Declaration of Commitment. Office of the Undersecretary for Health, Ministry of Health and Medical Education, Centre for Diseases Management. Egypt, Iran: UNAIDS, 2006.
4. Des Jarlais DC, Choopanya K, Millson P, et al. The structure of stable seroprevalence HIV-1 epidemic among injecting drug users. In: Stimson G, Des Jarlais DC, Ball A, eds. *Drug Injecting and HIV Infection*. London, United Kingdom: UCL Press Limited, 1998.
5. Des Jarlais DC, Friedman SR, Novick DM, et al. HIV-1 infection among intravenous drug users in Manhattan, New York City, from 1977 through 1987. *JAMA* 1989; 261:1008–1012.
6. Lima ES, Friedman SR, Bastos FI, et al. Risk factors for HIV-1 seroprevalence among drug injectors in the cocaine-using environment of Rio de Janeiro. *Addiction* 1994; 89:689–698.
7. Ross MW, Wodak A, Gold J, et al. Differences across sexual orientation on HIV risk behaviours in injecting drug users. *AIDS Care* 1992; 4:139–148.
8. Guo H, Wei JF, Yang H, et al. Rapidly increasing prevalence of HIV and syphilis and HIV-1 subtype characterization among men who have sex with men in Jiangsu, China. *Sex Transm Dis* 2009; 36:120–125.
9. Zamani S, Ichikawa S, Nassirimanesh B, et al. Prevalence and correlates of hepatitis C virus infection among injecting drug users in Tehran. *Int J Drug Policy* 2007; 18:359–363.
10. Zamani S, Kihara M, Gouya MM, et al. High prevalence of HIV infection associated with incarceration among community-based injecting drug users in Tehran, Iran. *J Acquir Immune Defic Syndr* 2006; 42:342–346.
11. Zamani S, Kihara M, Gouya MM, et al. Prevalence of and factors associated with HIV-1 infection among drug users visiting treatment centers in Tehran, Iran. *AIDS* 2005; 19:709–716.
12. Gallo D, George JR, Fitchen JH. Evaluation of a system using oral mucosal transudate for HIV-1 antibody screening and confirmatory testing. OraSure HIV Clinical Trials Group. *JAMA* 1997; 277:254–258.
13. Beyrer C, Sripaipan T, Tovananabutra S, et al. High HIV, hepatitis C and sexual risks among drug-using men who have sex with men in northern Thailand. *AIDS* 2005; 19:1535–1540.
14. Bluthenthal RN, Kral AH, Gee L, et al. Trends in HIV seroprevalence and risk among gay and bisexual men who inject drugs in San Francisco, 1988 to 2000. *J Acquir Immune Defic Syndr* 2001; 28:264–269.
15. Bull SS, Piper P, Rietmeijer C. Men who have sex with men and also inject drugs—profiles of risk related to the synergy of sex and drug injection behaviors. *J Homosex* 2002; 42:31–51.
16. O'Connell JM, Lampinen TM, Weber AE, et al. Sexual risk profile of young men in Vancouver, British Columbia, who have sex with men and inject drugs. *AIDS Behav* 2004; 8:17–23.
17. Latkin CA, Vlahov D, Anthony JC. Socially desirable responding and self-reported HIV infection risk behaviors among intravenous drug users. *Addiction* 1993; 88:517–526.

Sexual behavior of Japanese tourists visiting Thailand a key informant approach

Surasing Visrutaratna, Dr. PH.
Chiang Mai Public Health Office,
Chiang Mai, Thailand

Siriporn Wongchai
Chiang Mai Public Health Office,
Chiang Mai, Thailand

Manoon Jaikueankaew
Office of Disease Prevention and
Control, Region 10, Chiang Mai,
Thailand

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

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

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

Corresponding Author

Surasing Visrutaratna
Chiang Mai Public Health Office,
Chiang Mai, Thailand

E-mail : surasing@bkk2.loxinfo.co.th

Received, 24 October 2009

Accepted, 4 January 2010

ABSTRACT

Visrutaratna S, Wongchai S, Jaikueankaew M, et.al. Sexual behavior of Japanese tourists visiting Thailand a key informant approach. *JPHD*. 2010; 8(1) : 33-44.

This study described the sexual behavior of Japanese tourists with local people during visiting Thailand, through qualitative and quantitative data collected from key-informants related to tourism (i.e. sex-workers, tour guides, and beach/boat boys) in 6 major tourist sites during the period from September 2006 to March 2007.

This study illustrated that some Japanese male and female tourists, may have sought sexual services from several sexual behaviors during their visit to Thailand. Some Japanese male tourists did not want to use condoms, and were only forced to do so by Thai sex workers. Equally important was the observation that certain female Japanese tourists engaged in sexual activities with Thai males, including tour guides, beach-boys/boat-boys, and male commercial sex workers. Although many of them used condoms during their first sexual act together, condom usage dramatically declined with every subsequent sexual act. This study illustrates that some female and male tourists, while visiting Thailand, engage in high risk sexual behavior. Surprisingly, it was found that some Japanese females, especially those under 30 years of age, exhibited sexual behavior that can facilitate the contraction and transmission of HIV as well as other sexually transmitted infections. The findings from this study show that educational initiatives should be undertaken in both Japan and Thailand focusing on consistently using condoms with vaginal, anal and oral sex.

Keywords sexual behavior, Japanese, tourist, Thailand

พฤติกรรมการณ์เพศสัมพันธ์ของนักท่องเที่ยวชาวญี่ปุ่นที่เดินทางมา ท่องเที่ยวในประเทศไทย-กรณีศึกษาจากผู้เกี่ยวข้อง

บทคัดย่อ

สุรสิงห์ วิศรุตรัตน์, ศิริพร วงศ์ชัย, มนูญ ใจเขื่อนแก้ว และคณะ. พฤติกรรมการณ์เพศสัมพันธ์ของนักท่องเที่ยวชาวญี่ปุ่นที่เดินทางมาท่องเที่ยวในประเทศไทย-กรณีศึกษาจากผู้เกี่ยวข้อง. ว.สาธารณสุขและการพัฒนา, 2553; 8(1) : 33-44.

การศึกษานี้มีวัตถุประสงค์เพื่อศึกษาพฤติกรรมเสี่ยงที่เกี่ยวข้องกับการมีเพศสัมพันธ์ของนักท่องเที่ยวชาวญี่ปุ่นที่เดินทางมาท่องเที่ยวในประเทศไทยด้วยวิธีการศึกษาเชิงคุณภาพและใช้ข้อมูลการศึกษาเชิงปริมาณในบางพื้นที่เป็นการสนับสนุน โดยเก็บข้อมูลจากผู้ที่มีปฏิสัมพันธ์กับนักท่องเที่ยวโดยตรง เช่น หญิงบริการชายบริการ มัคคุเทศก์ เด็กวัยรุ่นชายที่ให้บริการแก่นักท่องเที่ยว ตามชายหาดและเรือท่องเที่ยว สำหรับพื้นที่ในการเก็บข้อมูลประกอบด้วย จังหวัดเชียงใหม่ ภูเก็ต สุราษฎร์ธานี กระบี่ ชลบุรีและกรุงเทพมหานครในช่วงเวลา ระหว่างเดือนกันยายน พ.ศ. 2549 ถึงเดือนมีนาคม พ.ศ. 2550

ผลการศึกษาแสดงให้เห็นว่าบางส่วนของนักท่องเที่ยวชาวญี่ปุ่นทั้งชายและหญิงมีพฤติกรรมการณ์เพศสัมพันธ์กับบุคคลหลายกลุ่มนักท่องเที่ยวชายบางส่วนไม่ต้องการใช้ถุงยางอนามัย แต่จำเป็นต้องใช้เพราะหญิงบริการบังคับให้ใช้ ในขณะที่เดียวกันพบว่านักท่องเที่ยวหญิงบางส่วนมีเพศสัมพันธ์กับมัคคุเทศก์ ชายขายบริการ เด็กวัยรุ่นชายที่ให้บริการแก่นักท่องเที่ยวตามชายหาดและเรือท่องเที่ยว ในกลุ่มนี้ยังพบว่าการใช้ถุงยางอนามัยในการมีเพศสัมพันธ์ในครั้งแรก แต่การมีเพศสัมพันธ์ในครั้งต่อๆมามากไม่ใช้ถุงยางอนามัย สรุปได้ว่านักท่องเที่ยว ทั้งหญิงและชายที่มีเพศสัมพันธ์มีโอกาสเสี่ยงสูงที่จะได้รับ เชื้อเอชไอวีหรือโรคติดต่อทางเพศสัมพันธ์อื่นๆ

คำสำคัญ พฤติกรรมการณ์เพศสัมพันธ์ นักท่องเที่ยว ญี่ปุ่น ประเทศไทย

INTRODUCTION

With the increase of global tourism, over the last several decades, people's sexual behavior during travel has become a topic of interest to many public health specialists and social scientists. There have been many publications, either presented in books or as research studies, focusing on the sexual behavior of tourists in various parts of the world. This includes Cabada and others who studied the sexual behavior of tour guides in Peru.¹ Taylor studied the sexual behavior of female tourists in the Dominican Republic and Jamaica.² Bellis reported on the sexual behavior of young people who visited popular tourist spots in Spain.³ Orisatoki studied the role of tourism in contributing to the HIV/AIDS epidemic in the Caribbean.⁴ Thailand has, over the past two decades, emerged as one of Asia's premier tourist locations, and accordingly many millions of international tourists are constantly traveling across the country, from the pristine sandy beaches in the South to the rugged mountains in the North. The number of Japanese tourists visiting Thailand, over the past two decades, has increased every year. A Thai tourism authority report indicated that 1,248,700 Japanese tourists arrived in Thailand during 2007.⁵ There are several studies that describe the sexual behavior of Japanese tourists in Thailand. Cash⁶ studied Japanese male tourists and businessmen in 1994 through the use of in-depth interviews and focus group discussions. The author found that 71% of Japanese men engaged in sexual activities with commercial sex workers. The overwhelming majority (>95%) of these men, however, used condoms. Nemoto and others⁷ studied high risk behavior of Japanese tourists in Khaosan Road Bangkok in 2002 through the use of self-administered questionnaires. They found that 91%

of tourists used condoms with sex workers when engaging in vaginal sex, while 47% used condoms when engaging in oral sex. With respect to Japanese female tourists Vorakit-phokatorn⁸ studied the behavior of young Japanese women in 1994. She found that they were culturally and socially native and willing to take risks with respect to sexual contacts with local Thai men.

The present study was designed to explore the sexual risk behavior of Japanese tourists with local people from a different perspective, namely by collecting relevant information from the sexual partners of Japanese tourists (e.g. male or female sex workers, tour guides, beach/boat boys). The researchers felt that many sexually related issues could be very sensitive (e.g. the use of condoms, oral sex practices, etc.) and accordingly it would be difficult to approach foreign tourists. Even if this was possible the researchers were concerned that it would be very difficult to verify the reliability of any data that they could collect. Accordingly, they decided instead to directly interview and talk with the sexual partners of the Japanese tourists. It was hoped that the latter could provide a more objective, or unbiased, synopsis of what transpired during these sexual encounters. The study included a mixture of qualitative and quantitative approaches in order to obtain the pertinent information. The qualitative method provided details of behaviors and quantitative technique provided projection amount of actions.

METHODS

This study was approved by the Chiang Mai Public Health Research Committee and was implemented during the period September 2006 - March 2007. The researchers collected

information from key informants who had sex with Japanese tourists or who had information about friends who had engaged in sex with Japanese tourists (i.e. sex-workers, beach/boat boys, and tour guides) working in 6 tourist spots in Thailand.

Study Design

Qualitative methods, including in-depth interviews and focus group discussions, were the main data collection methodologies employed in this study. A quantitative method (self-administered questionnaires) was also used as a supportive data collection instrument for a group of male sex-workers in a northern province and for a group of beach/boat boys in a southern province of Thailand. The sample sizes for the quantitative study were calculated from the Yamane formula⁹. Minimum sample size for male sex workers and beach/boat boys were respectively 101 and 76 respondents.

Methodological explanation

Because of the difficulties inherent in approaching the study population, the study team used various approaches to collect data from each key informants group.

Tour guides(TGs) - Local public health staff from each province contacted Japan tour companies, in their own geography area, to participate in focus group discussions. In those tourist spots where there were few Japanese tour guides, the research team performed in-depth interviews with each respondent. We performed 2 focus group discussions and 11 in-depth interviews.

Female sex workers(FSSs) - Local public health staff identified and mapped the establishments that provided sexual services for Japanese clients (e.g. Japanese bars). They contacted and obtained permission to conduct the study with the managers

of these establishments. The researchers conducted 4 focus group discussions with sex workers in one province. In the other provinces, researchers generally conducted only 2 focus group discussions if there were not any new issues to discuss that arose from the earlier discussions. In those tourist spots where there were a small number of sex workers engaging in sexual activities with Japanese clients the researchers conducted in-depth interviews with the respondents. In brief the researchers were able to have access to most of the popular places frequented by Japanese tourists in each of the 6 provinces. They subsequently were able to randomly approach members of the different "target groups", who were not engaged with Japanese clients, at the time of these visits. We performed 13 focus group discussions and 5 in-depth interviews.

Male sex workers(MSSs) - Local public health staff identified and mapped the gay bars that provided sexual services for Japanese clients. The researchers had earlier conducted a pilot study focusing on male sex workers. One of the main findings was that there was a great deal of peer pressure for male sex workers to exaggerate their "sexual exploits" when in a group setting. As such it was felt that it would be better to conduct in-depth interviews rather than focus group discussions to ensure that the data was reliable and accurate. We performed 40 in-depth interviews.

Beach/boat boys - local public health staff identified and mapped the beaches where there were beach/boat boys. From another earlier pilot study, among this group, researchers also observed that there was a great deal of peer pressure to exaggerate one's "sexual exploits" when in a group setting. Therefore the research team similarly decided to conduct in-depth interviews with this target group. The local public health coordinator initially contacted members