



SJR

Scimago Journal & Country Rank

Enter Journal Title, ISSN or Publisher Name

[Home](#)[Journal Rankings](#)[Country Rankings](#)[Viz Tools](#)[Help](#)[About Us](#)[i](#) [x](#)

Human Behaviour and Brain

HumanBaB is a peer-reviewed, open access, interdisciplinary and international journal.

Human Behaviour and Brain

[OPEN](#)

AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV

92

H Index

Country	United Kingdom - SIR Ranking of United Kingdom
Subject Area and Category	Medicine Public Health, Environmental and Occupational Health Psychology Social Psychology Social Sciences Health (social science)
Publisher	Routledge
Publication type	Journals
ISSN	13600451, 09540121
Coverage	1989-2020
Scope	<p>AIDS Care provides a forum for publishing in one authoritative source research and reports from the many complementary disciplines involved in the AIDS/HIV field. These include, among others: psychology, sociology, epidemiology, social work and anthropology, social aspects of medicine, nursing, education, health education, law, administration, counselling (including various approaches such as behavioural therapy, psychotherapy, family therapy etc). AIDS and HIV infection, the planning of services, prevention and the fear of AIDS affects many echelons of society ranging from individuals, couples and families through to institutions and communities. A particular aim is to publish work emanating from many centres and in so doing address the global impact of AIDS.</p>
?	Homepage How to publish in this journal Contact Join the conversation about this journal

Call For Paper Sept 2020

Globally Indexing Science & Technology JOURNAL

ijetst.in

OPEN

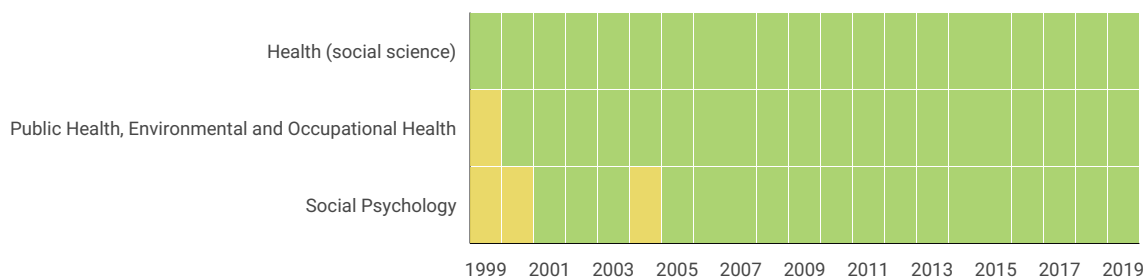
Call For Paper Sept 2020

Globally Indexing Science & Technology JOURNAL

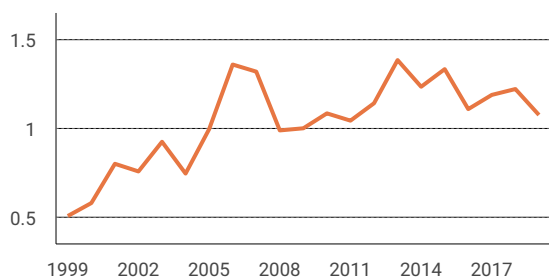
ijetst.in

OPEN

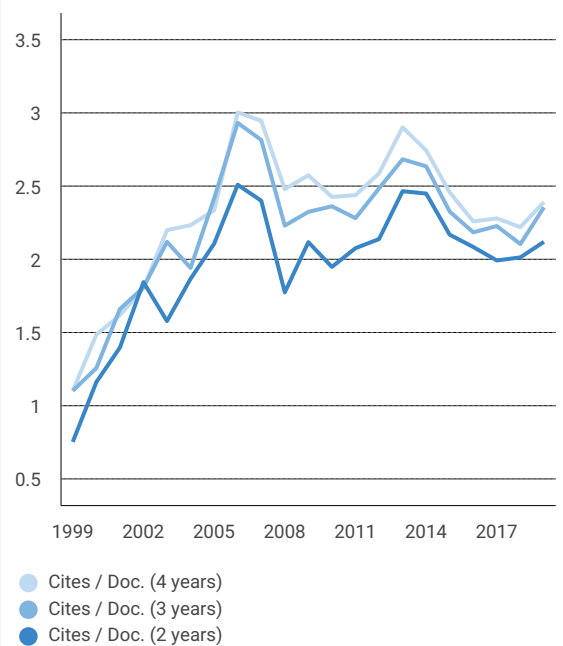
Quartiles



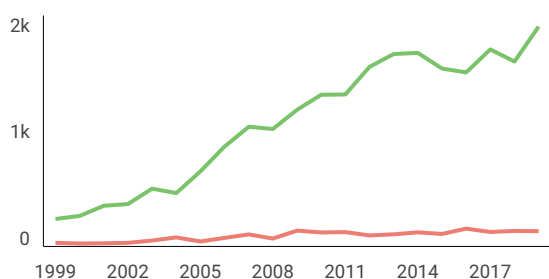
SJR



Citations per document



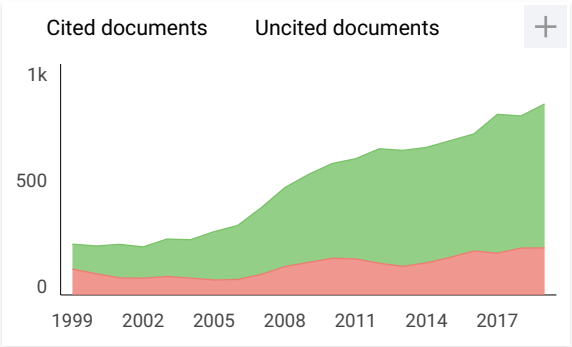
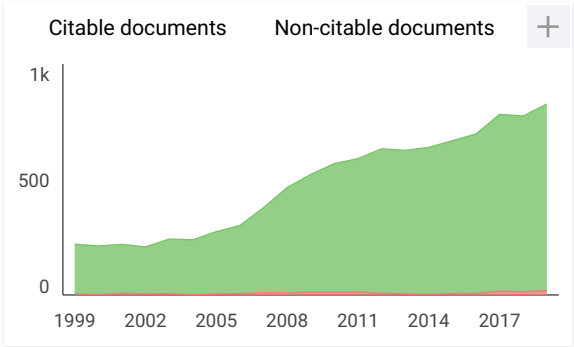
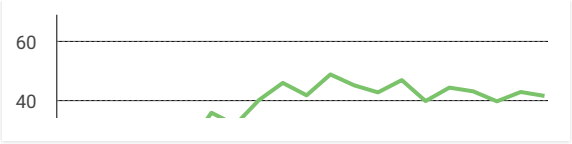
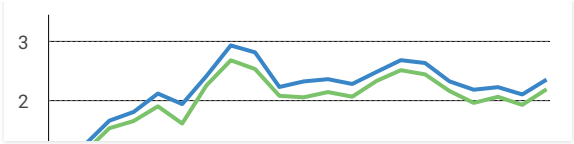
Total Cites Self-Cites



External Cites per Doc

Cites per Doc

% International Collaboration



AIDS Care - Psychological and Socio-Medical Aspects...

Q1 Health (social science) best quartile

SJR 2019
1.08

powered by scimagojr.com

← Show this widget in your own website

Just copy the code below and paste within your html code:

`<a href="https://www.scimaç`

| **irwan** 2 years ago

feewwww

reply

Leave a comment

Name

Email

(will not be published)



AIDS Care

Psychological and Socio-medical Aspects of AIDS/HIV

2019 Impact Factor
1.894

[Publish open access in this journal](#)

AIDS Care is a multidisciplinary journal that publishes HIV/AIDS research into the prevention of infection and psychosocial aspects of care and treatment.

[Advanced search](#)

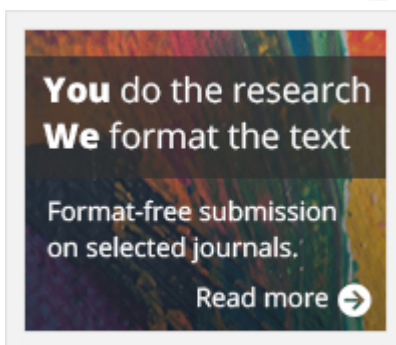
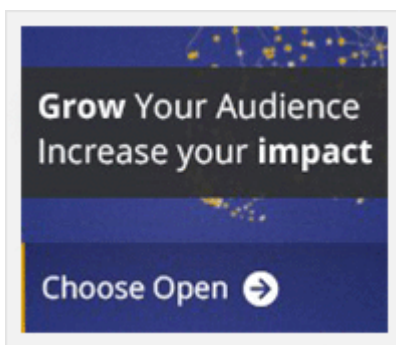
Submit an article  New content alerts  RSS Subscribe  Citation search

 Current issue  Browse list of issues  Explore

This journal



Sample Our
Medicine, Dentistry, Nursing &
Allied Health journals



Journal news

Looking to publish open access? Read the Instructions for Authors and submit your paper today.

Obituary for Prof Gita Ramjee. Untimely snatched from the world by Covid19

Call for papers

Special Issue: Chronic pain in people living with HIV

Latest articles

Article

Daily and near-daily cannabis use is associated with HIV viral load suppression in people living with HIV who use cocaine >

Slawek et al.

Published online: 4 Aug 2020

Article

[“No good man will ever want me”. How structural social inequality increases women’s vulnerability to HIV transmission: a qualitative study from Bandung, Indonesia >](#)

Rahmalia et al.

Published online: 4 Aug 2020



Article

[Regional differences of self-reported HIV testing among men in Haiti: an analysis of the 2016–2017 Demographic and Health Survey >](#)

Hamilton et al.

Published online: 4 Aug 2020

Article

[Are patient outcomes improved by models of professionally-led community HIV management which aim to be person-centred? A systematic review of the evidence >](#)

Abboah-Offei et al.

Published online: 3 Aug 2020

[View more >](#)

[See all volumes and issues](#)

<	Vol 32, 2020	Vol 31, 2019	Volume 30 >
----------------------	------------------------------	------------------------------	--

<	Sup	Issue	Issue	Issue I:	>
	1	12	11	10	
				▼	

☐ [Download citations](#)

Articles

☐ Article
[Use of testosterone in men infected with human immunodeficiency virus in the veterans healthcare system](#) >

Guneet K. Jasuja, Shalender Bhasin, Adam J. Rose, Joel I. Reisman, Avy Skolnik, Dan R. Berlowitz & Allen L. Gifford

Pages: 1207-1214

Published online: 19 Mar 2018

169	0	2
Views	CrossRef citations	Altmetric

☐ Article
[High condom use but low HIV testing uptake reported by men who purchase sex in Bali, Indonesia](#) >

Luh Putu Lila Wulandari, John Kaldor & Pande Putu Januraga

Pages: 1215-1222

Published online: 20 Mar 2018

202	1	11
Views	CrossRef citations	Altmetric

Article

○ [Perceptions of and intentions to use a recently introduced blood-based HIV self-test in France >](#)

Paul-Emmanuel Devez & Olivier Epaulard

Pages: 1223-1227

Published online: 10 Jun 2018

148	0	2
Views	CrossRef citations	Altmetric

Article

○ [Feasibility of an internet-based HIV testing service: anonymous urine collection from men who have sex with men >](#)

DongYan Xia, Xia Feng, XiaoXia He, GuoWu Liu, Yi Lyu, Huanyi Cheng, Yan Jiang & HongYan Lu

Pages: 1228-1230

Published online: 14 Jun 2018

119	0	1
Views	CrossRef citations	Altmetric

Article

○ [Barriers to achieving the first 90%: gender norms and HIV testing among men in the Democratic Republic of the Congo >](#)

Geeta Nanda, Leila Dal Santo, Joel Nkiama Konde & Berengere de Negri

Pages: 1231-1238

Published online: 27 Jun 2018

132	0	1
Views	CrossRef citations	Altmetric

Article

○ [Implementation and assessment of a model to increase HIV testing among men who have sex with men and transgender women in Thailand, 2011–2016](#) >

Montinee Wasantioopapokakorn, Chomnad Manopaiboon, Thanongsri Phoorisri, Akechitra Sukkul, Cheewanan Lertpiriyasuwat, Sumet Ongwandee, Farida Langkafah, Usanee Kritsanavarin, Prin Visavakum, Bongkoch Jetsawang, Somboon Nookhai, Prapaporn Kitwattanachai, Wanwimon Weerawattanayotin, Mana Losirikul, Naruemon Yenyarsun, Nuchapong Jongchotchatchawal & Michael Martin

Pages: 1239-1245

Published online: 27 Jun 2018

299	0	1
Views	CrossRef citations	Altmetric

Article

○ [Relationship between illness representations and mental health among HIV-positive men who have sex with men](#) >

Phoenix Kit-han Mo, Joseph Tak-fai Lau & Xiaobing Wu

Pages: 1246-1251

Published online: 04 Mar 2018

196	1	2
Views	CrossRef citations	Altmetric

Article

○ [Syndemic effect of mental illness and substance use on viral suppression among recently-incarcerated, HIV-infected individuals in the CARE+ Corrections study](#) >

Hannah Yellin, Curt Beckwith, Ann Kurth, Tao Liu, Breana Castonguay, Rudy Patrick, Claudia Trezza, Lauri Bazerman & Irene Kuo

Pages: 1252-1256

Published online: 01 Apr 2018

191	0	3
Views	CrossRef citations	Altmetric

○ Article

[Resilience as a moderator between syndemics and depression in mothers living with HIV >](#)

Idia B. Thurston, Kathryn H. Howell, Rebecca C. Kamody, Courtney Maclin-Akinyemi & Jessica Mandell

Pages: 1257-1264

Published online: 02 Mar 2018

296	0	1
Views	CrossRef citations	Altmetric

○ Article

[Are people living with HIV less productive at work? >](#)

Kaya Verbooy, Marlies Wagener, Meriam Kaddouri, Pepijn Roelofs, Harald Miedema, Eric van Gorp, Werner Brouwer & Job van Exel

Pages: 1265-1272

Published online: 07 Mar 2018

1614	1	8
Views	CrossRef citations	Altmetric

○ Article

[Correlates of exchange sex among a population-based sample of low-income women who have heterosexual sex in Baltimore >](#)

Susan G. Sherman, Marisa Hast, Ju Nyeong Park, Michele R. Decker, Colin Flynn & Danielle German

Pages: 1273-1281

Published online: 08 Mar 2018

175	0	2
Views	CrossRef citations	Altmetric


- Article
-  [HIV Risk perception and eligibility for pre-exposure prophylaxis in women involved in the criminal justice system](#) >

Ronnye Rutledge, Lynn Madden, Onyema Ogbuagu & Jaimie P. Meyer

Pages: 1282-1289

Published online: 11 Mar 2018

425	0	4
Views	CrossRef citations	Altmetric


- Article
-  [Associations between sexual partner number and HIV risk behaviors: implications for HIV prevention efforts in a Treatment as Prevention \(TasP\) environment](#) >

Heather L. Armstrong, Eric Abella Roth, Ashleigh Rich, Nathan J. Lachowsky, Zishan Cui, Paul Sereda, Kiffer G. Card, Jody Jollimore, Terry Howard, David M. Moore & Robert S. Hogg

Pages: 1290-1297

Published online: 20 Mar 2018

272	2	1
Views	CrossRef citations	Altmetric


- Article
-  [The effect of partner HIV status on motivation to take antiretroviral and isoniazid preventive therapies: a conjoint analysis](#) >

Hae-Young Kim, Colleen F. Hanrahan, David W. Dowdy, Neil Martinson, Jonathan Golub & John F P Bridges

Pages: 1298-1305

Published online: 29 Mar 2018

112	1	1
Views	CrossRef citations	Altmetric

- Article
-  [Differences in awareness of and willingness to use pre-exposure prophylaxis and anticipated condom use among serodiscordant couples in Taiwan >](#)

Nai-Ying Ko, Huei-Jiuan Wu, Carol Strong, Chia-Wen Li, Wen-Wei Ku & Su-Ting Hsu

Pages: 1306-1310

Published online: 30 May 2018

135	0	2
Views	CrossRef citations	Altmetric

- Article
-  [Understanding women and men's acceptability of current and new HIV prevention technologies in KwaZulu-Natal, South Africa >](#)

Eliza Govender & Quarraisha Abdool Karim

Pages: 1311-1314

Published online: 18 Jun 2018

333	2	2
Views	CrossRef citations	Altmetric

- Article
-  [Exchange sex among people receiving medical care for HIV in the United States – medical monitoring project 2009–2013 >](#)

Oluwatosin Olaiya, Lina Nerlander, Christine L. Mattson & Linda Beer

Pages: 1315-1321

Published online: 20 Apr 2018

173	0	1
Views	CrossRef citations	Altmetric

- Article
 [Injection drug use, food insecurity, and HIV-HCV co-infection: a longitudinal cohort analysis >](#)

Taylor McLinden, Erica E. M. Moodie, Sam Harper, Anne-Marie Hamelin, Aranka Anema, Wusiman Aibibula, Marina B. Klein & Joseph Cox

Pages: 1322-1328

Published online: 01 May 2018

191	0	7
Views	CrossRef citations	Altmetric


- Article
 [Perceived risk of developing smoking-related disease among persons living with HIV >](#)

Lauren R. Pacek, F. Joseph McClernon, Olga Rass, Maggie M. Sweitzer & Matthew W. Johnson

Pages: 1329-1334

Published online: 22 Apr 2018

85	0	4
Views	CrossRef citations	Altmetric

- Article
 [Risk factors associated with multi-dimensional stigma among people living with HIV/AIDS who are homeless/unstably housed >](#)

Jessica A. Davila, Howard J Cabral, Manisha H. Maskay, Ruthanne Marcus, Yiyang Yuan, Nicole Chisolm, Pamela Belton, Lisa McKeithan & Serena Rajabuin

Pages: 1335-1340

Published online: 07 Jun 2018

454	1	3
Views	CrossRef citations	Altmetric

Explore

Most read articles

Most cited articles

 Open access articles



Article

HIV-related stigma within communities of gay men: a literature review >

Smit et al.

Volume 24, 2012 - Issue 4

Published online: 10 Apr 2012

Views: 22876



Article

An interdisciplinary HIV-adherence program combining motivational interviewing and electronic antiretroviral drug monitoring >

Krummenacher et al.

Volume 23, 2011 - Issue 5

Published online: 25 Jan 2011

Views: 8406

Article

Social protection to support vulnerable children and families: the potential of cash transfers to protect education, health and nutrition >

Adato et al.

Volume 21, 2009 - Issue sup1

Published online: 30 Sep 2009

Views: 6262



Article

Community health workers, recipients' experiences and constraints to care in South Africa – a pathway to trust >

Nxumalo et al.

Volume 28, 2016 - Issue sup4

Published online: 26 Jun 2016

Views: 5309



[View more >](#)

Information for

[Authors](#)[Editors](#)[Librarians](#)[Societies](#)

Open access

[Overview](#)[Open journals](#)[Open Select](#)[Cogent OA](#)

Help and info

[Help & contact](#)[Newsroom](#)[Commercial services](#)[All journals](#)[Books](#)

Keep up to date

Register to receive personalised research and resources by email

[Sign me up](#)

Copyright © 2020 Informa UK Limited

[Privacy policy](#)[Cookies](#)[Terms & conditions](#)[Accessibility](#)

 Taylor & Francis Group
Taylor & Francis Group

Registered in England & Wales No. 3099067

5 Howick Place | London | SW1P 1WG



This journal



Editorial board

Executive Editor:

Lorraine Sherr - University College London, London, UK

Editorial Committee:

Lucie Cluver - University of Oxford, UK and University of Cape Town, South Africa

Maria Ekstrand - University of California, USA

Richard Harding - Guy's, King's & St Thomas' School of Medicine, Kings College London, UK

International Editorial Board:

Ad la nē ari RSS e, Subscribe

Jan Anderson - London, UK

Sheana Salyers Bull - Colorado, USA

Catherine Campbell - London, UK

José Catalan - Chelsea & Westminster Hospital, UK

Thomas Coates - Los Angeles, USA

Frances Cowan - University of Liverpool, UK

Udi Davidovich - Amsterdam, The Netherlands

James W. Dilley - San Francisco, USA

Anke Ehrhardt - New York, USA

Jonathon Elford - London, UK

Ian Paul Everall - Melbourne, Australia

Jeffrey Fisher - Connecticut, USA

Simon Gregson - London, UK

G. J. P. van Griensven - Amsterdam, The Netherlands

Catherine Hankins - McGill University, Montreal, Quebec, Canada

Anita Hardon - Amsterdam, The Netherlands

Graham Hart - London, UK

Sarah Hawkes - London, UK

Don des Jarlais - New York, USA

Rachel Jewkes - Pretoria, South Africa

Kai Jonas - Amsterdam, The Netherlands

Seth Kalichman - Connecticut, USA

The Hon. Michael Kirby - Sydney, Australia

Joseph Lau - Hong Kong

Xiaoming Li - South Carolina, USA

Mona Loutfy - Toronto, Canada

Kevin Mayer - Boston, Massachusetts, USA

Matthew Mimiaga - Brown University, Rhode Island, USA

Jean-Paul Moatti - Marseilles, France

Debra A. Murphy - Los Angeles, USA

Seth M. Noar - Kentucky, USA

Robert H. Remien - New York, USA

Theo Sandfort - New York, USA

Janet Seeley - East Anglia, UK

Maryam Shamanesh - London, UK

Steve Shoptaw - Los Angeles, USA

Jane M. Simoni - Washington, USA

Bruno Spire - Marseilles, France

Ron Stall - University of Pittsburgh, Pittsburgh USA

Eileen Stillwaggon - Philadelphia, USA

Steffanie Strathdee - California, USA

Ann-Marie Strebel - Cape Town, South Africa

Tonya Renee Thurman - Cape Town, South Africa

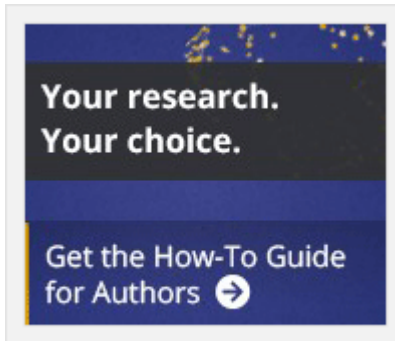
Norma Ware - Boston, Massachusetts, USA

Alan Whiteside - Waterloo, Canada

John B. F. de Wit - Utrecht, Netherlands

Richard Wolitski - Washington D.C, USA

journals



[Authors](#)[Editors](#)[Librarians](#)[Societies](#)[Overview](#)[Open journals](#)[Open Select](#)[Cogent OA](#)[Help and info](#)[Help & contact](#)[Newsroom](#)[Commercial services](#)[All journals](#)[Books](#)[Keep up to date](#)

Register to receive personalised research and resources by email

[Sign me up](#)

Copyright © 2020 Informa UK Limited

[Privacy policy](#)[Cookies](#)[Terms & conditions](#)[Accessibility](#)

Registered in England & Wales No. 3099067
5 Howick Place | London | SW1P 1WG



High condom use but low HIV testing uptake reported by men who purchase sex in Bali, Indonesia

Luh Putu Lila Wulandari, John Kaldor & Pande Putu Januraga

To cite this article: Luh Putu Lila Wulandari, John Kaldor & Pande Putu Januraga (2018): High condom use but low HIV testing uptake reported by men who purchase sex in Bali, Indonesia, AIDS Care, DOI: [10.1080/09540121.2018.1453920](https://doi.org/10.1080/09540121.2018.1453920)

To link to this article: <https://doi.org/10.1080/09540121.2018.1453920>



Published online: 20 Mar 2018.



Submit your article to this journal [↗](#)



View related articles [↗](#)



View Crossmark data [↗](#)



High condom use but low HIV testing uptake reported by men who purchase sex in Bali, Indonesia

Luh Putu Lila Wulandari ^{a,b}, John Kaldor^b and Pande Putu Januraga^{a,c}

^aDepartment of Public Health and Preventive Medicine, Faculty of Medicine, Udayana University, Bali, Indonesia; ^bThe Kirby Institute, University of New South Wales, Sydney, Australia; ^cDiscipline of Public Health, Flinders University, Adelaide, Australia

ABSTRACT

Men who purchase sex (MWPS) have long been considered as one of the population groups at risk of HIV transmission. However, while HIV-related interventions have been targeted towards this group, few studies have directly recruited MWPS to measure the impact of such interventions. This study aimed to fill the gap for Indonesia by identifying the level and predictors of condom use and HIV testing among MWPS, to inform prevention strategies. A cross-sectional study was conducted by surveying 200 MWPS in Bali, Indonesia in 2015. A structured questionnaire was administered to collect the data. Self-reported condom use on the occasion of last paid sex was very high (88.5%), while a history of HIV testing was low (8.1%). None of the variables identified in this study were associated with condom use at last paid sex. Men were more likely to report a history of HIV testing if they: perceived themselves to be at high risk of HIV, had a higher level of HIV-related knowledge, reported a history of genital ulcers or urethral discharge in the past 12 months, or were aware that confidential HIV testing was available. Implications and limitations of this study are discussed.

ARTICLE HISTORY

Received 29 August 2017
Accepted 13 March 2018

KEYWORDS

HIV test; condom use; clients of sex workers; men who purchase sex; Indonesia



Introduction

Men who purchase sex (MWPS) have long been considered as one of the population groups at risk of HIV transmission based on their sexual contact with sex workers – a population recognised to have high rates of HIV in many countries (UNAIDS, 2015). Although some studies have reported a low HIV prevalence of 0–0.1% among MWPS, for example studies in Amsterdam (van Haastrecht et al., 1993) and Switzerland (Darling et al., 2012), high HIV prevalence among this group has also been reported often, for example in studies in Benin (Alary et al., 2003; Lowndes et al., 2000), Haiti (Couture et al., 2008), Cambodia (Hor et al., 2005), Vietnam (Nadol et al., 2017), China (Reilly et al., 2012) and India (Shaw et al., 2013), ranging from 5.7% to 26.5%.

It is estimated at present that 530,000–730,000 people in Indonesia are infected with HIV (UNAIDS, 2016b), concentrated mainly among people who inject drugs (PWIDs) (28.76%), transgenders (24.8%), direct female sex workers (FSWs) (5.3%), men who have sex with men (MSM) (25.8%), and prisoners (2.6%) (UNAIDS, 2016a). The Integrated Biological and Behavioural Surveillance (IBBS) carried out in Indonesia in 2007 and

2011 recorded an increase in the prevalence of high-risk men (considered a proxy of MWPS) with HIV, from 0.1% in 2007 to 0.7% in 2011 (Indonesian Ministry of Health, 2011).

Many interventions in Indonesia have been undertaken to reduce the risk of HIV among MWPS, including work-based education sessions (The HIV Cooperation Program for Indonesia, 2015), condom promotion in brothel areas, STI treatment and the expansion of HIV testing sites (Indonesian National AIDS Commission, 2010). However, even though selling or buying sex are not considered criminal acts in this setting, the stigma associated with purchasing sex makes it difficult to reach MWPS for research, including intervention evaluation. While a number of studies in Indonesia have recruited men from particular occupational groups as a proxy for MWPS (Indonesian Ministry of Health, 2011; Mustikawati et al., 2009), very few have directly recruited MWPS. In order to fill this gap, we conducted a cross-sectional survey among men attending brothels in Bali to identify the level and predictors of self-reported condom use at last sex with FSWs and had ever received HIV testing among MWPS in this setting.

CONTACT Luh Putu Lila Wulandari  lwulandari@unud.ac.id, lwulandari@kirby.unsw.edu.au  Faculty of Medicine, School of Postgraduate Program in Public Health, Udayana University, Jl P.B Sudirman, Denpasar, Bali 80232, Indonesia; The Kirby Institute, University of New South Wales, Level 6 Wallace Wurth Building, UNSW Kensington Campus, Sydney, NSW 2052, Australia

© 2018 Informa UK Limited, trading as Taylor & Francis Group

Methods

This study was conducted where the commercial sex industry in Bali is concentrated: in brothel areas of Denpasar. At the time of the study, there were at least seven brothel areas, often called complexes, recognised by health officials as operating in Denpasar.

A cross-sectional survey was conducted among 200 MWPS in these brothels. For the purpose of this study, MWPS were defined as men who presented at one of the participating brothel sites. Inclusion criteria comprised being 18 years of age or older and self-reported sexual contact with at least one FSW in the past 12 months.

The survey was conducted from September to November 2015. Four field workers (all men from Bali), who were attending the brothels to carry out HIV prevention activities that targeted FSWs during this period, approached men visiting the brothels. The field workers presented at brothels every night from about 9pm to 1am. Face-to-face interviews were conducted in Indonesian and took about an hour. Men were interviewed before any sexual contact took place at the brothel, or at a place convenient to them. All the men who were approached were offered a voucher with information about free HIV testing at an HIV testing clinic. In this setting, supported by government funding, HIV testing is offered for free. Vouchers were given to inform participants of the free testing, not for monetary values.

A structured questionnaire was adapted and modified from the IBBS used in 2011 (Indonesian Ministry of Health, 2011). It included questions on sociodemographic characteristics, sexual behaviours, HIV-related perception and knowledge, alcohol use, and history of STIs and HIV testing. Before the data collection began, the questionnaire was pilot tested, with revisions then made accordingly. Consent was gained from each participant before the interview.

Data analysis

Data was analysed using Stata 14 (Statacorp LP, Texas, USA), with an add-on package for Firth's logistic regression (Coveney, 2015). Duplicate observations were identified using a particular command in Stata 14 (StataCorp, 2015).

The outcome variables were: self-reported condom use at last sex with FSWs, and ever having received HIV testing. The measurement of the outcome variables was a binary response of "yes" and "no". To identify associations of condom use at last sex with a FSW and ever having received HIV testing, bivariate analysis using Firth's modified logistic regression was performed. This method is required due to the complete

separation in some associated variables, whereby the outcome variable is completely identified with one category of an associated variable (Heinze & Schemper, 2002).

Independent variables included in the bivariate analysis were age, education level, marital status, perceived risk of HIV, perceived seriousness of HIV, knowledge of HIV transmission, awareness of confidential HIV testing, alcohol use in the past four weeks, the numbers of FSW partners in the past 12 months, the number of sexual contacts with FSWs in the past month, and a history of genital ulcers or discharge within the past 12 months. Knowledge of HIV transmission was defined as the ability to answer five out of five questions correctly about HIV transmission and prevention methods. The five questions on knowledge included: knowledge on preventing HIV transmission through being faithful; using a condom; knowledge that HIV cannot be transmitted through mosquito bites; knowledge that HIV cannot be transmitted through sharing food utensils, and knowledge that someone who looks healthy could actually be HIV positive. These questions were chosen based on the WHO/UNAIDS guidelines for collecting core indicator data on HIV knowledge for the purpose of global AIDS response progress reporting (World Health Organization and UNAIDS, 2015). Some variables such as a participant's age and the number of FSWs they had had sexual contact with in the past 12 months were combined to be dichotomous in order to allow a sufficient number of cases available in each category for analysis.

To control for confounders, multivariate analysis with Firth's modified logistic regression was also performed. Variables with *p*-value less than 0.1 in the bivariate analysis were included in the multivariate analysis. In addition regardless of the *p*-value of age or education in its association with condom use and HIV testing in the bivariate analysis, they were still included in the multivariate analysis because of evidence of an association between education and age with HIV testing (Martell, 2014). A *p*-value of less than 0.05 was considered significant in the multivariate analysis.

Ethics approval

Ethics approvals were gained from Udayana University, Bali and the Human Research Ethics Advisory Panel of the University of New South Wales, Australia.

Results

Of the 412 men who were approached, 200 agreed to participate, yielding a response rate of 48.5%.

Questionnaires from those 200 participants, with non-duplicated observations, were included in the analysis. Only a few missing observations were noted (with an average of 3.7%), so these were considered a minor inconvenience (Altman & Bland, 2007) and were ignored (Rye, Glenn, & William, 2010).

Participant characteristics

Table 1 shows the sociodemographic, HIV knowledge and behavioural characteristics of the respondents.

Fewer than 20% of the participants were 24 years of age or younger. More than half had a highest education level of junior high school or below and were married at the time. Only 44% of the men perceived they were at risk of HIV, but more than 60% perceived that HIV was a serious disease. Less than half of the men were aware of confidential HIV testing, and more than 60% had used alcohol in the past four weeks. In the past 12 months, 34% of the men had had sex with five or more FSWs. Only 14% of the men reported to have ever had genital ulcers or discharge in the past 12 months.

Condom use at last paid sex

Table 1 shows that 177 participants (88.5%) reported condom use at their last sex worker contact, while Table 2 shows factors associated with reported condom use at last sex with FSWs.

The bivariate analysis (Table 2) revealed that men who perceived themselves at high risk of contracting HIV, perceived HIV as a very serious disease, had contact with a smaller number of FSWs in the past 12 months, had more sexual contact with FSWs in the past month, or had a previous history of genital symptoms in the past 12 months, were statistically significantly more likely to use a condom at their last FSW contact. Men who completed senior high school or above were marginally more likely to use a condom at their last paid sexual encounter with a FSW compared with those who only completed junior high school or below. However, in the multivariate analysis, none of these associations was statistically significant, at the 0.05 level.

HIV testing

Fifteen respondents (8.1%) reported having been tested for HIV previously (Table 1). Table 3 shows factors associated with reported HIV testing. In the bivariate analysis, it was found that men who perceived themselves to be at high risk of HIV infection, perceived

Table 1. Sociodemographic, perception on HIV, and behavioural characteristics of participants.

Variables	Frequencies (Percentages)
Age	
24 years old and below	36 (19.67%)
25–34 years old	70 (38.25%)
35 years old and above	77 (42.08%)
Highest level of education	
Primary or junior high school	101 (51.01%)
Senior high school or above	97 (48.99%)
Current marital status	
Not married	69 (34.50%)
Currently married	131 (65.50%)
Do you perceive yourself at risk of contracting HIV?	
High risk	81 (43.78%)
Probably at risk	74 (40%)
Not at all/not sure	30 (16.22%)
Do you perceive HIV as a serious disease?	
Not at all, not too sure, not too serious	71 (38.38%)
Very serious	114 (61.62%)
Knowledge about HIV transmission	
Responding correctly to the 5 HIV-related knowledge questions	27 (14.67%)
Not responding correctly to the 5 HIV-related knowledge questions	157 (85.33%)
Aware that confidential HIV testing is available	
Yes	77 (42.08%)
No	106 (57.92%)
Alcohol use in the past 4 weeks	
Yes	131 (65.50%)
No	69 (34.50%)
Number of female sex workers you had sex with in the past 12 months	
1 or 2	79 (39.50%)
3 or 4	53 (26.50%)
5 or more women	68 (34%)
Condom use in the last sex with brothel-based sex workers	
Yes	177 (88.50%)
No/can't remember	23 (11.50%)
Reported ever having genital ulcers or discharge in the last 12 months	
Yes	28 (14%)
No	172 (86%)
Have you ever had an HIV test previously?	
Yes	15 (8.11%)
No	170 (91.89%)

HIV as a very serious disease, were able to respond correctly to the five HIV-related knowledge questions, were aware that confidential HIV testing was available, did not use alcohol in the past four weeks, had fewer FSWs visits in the past 12 months, had more sexual contact with FSWs in the past month, or had a history of genital symptoms in the past 12 months, were more likely to report having had an HIV test ever.

In the multivariate analysis, it was found that men were more likely to report HIV testing if they perceived themselves to be at high risk of contracting HIV (OR: 13.2 [95% CI: 2.16–81]), responded correctly to the five HIV-related knowledge questions (OR: 24.5 [95%CI: 5.05–118.96]), were aware that confidential HIV testing was available (OR: 54.5 [95%CI: 2.68–1100]), or reported genital ulcers or urethral discharge in the past 12 months (OR: 14.3 [95%CI: 2.2–91.7]). Despite the wide confidence interval, these associated factors were statistically significant.

Table 2. Bivariate and multivariate analysis of associated factors of reported condom use in the last sex with sex workers.

Variables	Used condom in the last sex with sex workers		Bivariate analysis			Multivariate analysis		
	<i>n</i>	%	OR	95%CI	<i>p</i> values	OR	95%CI	<i>p</i> values
Age								
24 years old and below	31	86.1%	0.6	0.2–1.8	0.38	0.7	0.2–2.4	0.60
25 years old and above	133	90.5%	1					
Highest level of education								
Primary or junior high school	86	85.2%	1					
senior high school or above	90	92.8%	2.2	0.86–5.43	0.10	2.3	0.8–6.2	0.11
Current marital status								
Not married	60	87%	1					
Currently married	117	89.3%	1.2	0.5–3.1	0.59			
Do you perceive yourself at risk of contracting HIV?								
Probably at risk, not at all/not sure	88	84.6%	1					
high risk	76	93.9%	2.6	0.9–7.1	0.07	2.6	0.9–7.1	0.07
Do you perceive HIV as a serious disease?								
Not at all, not too sure, not too serious	59	83.1%	1					
Very serious	105	92.1%	2.3	0.9–5.7	0.07	1.06	0.3–3.8	0.92
Knowledge about HIV transmission								
Responding correctly to the 5 HIV related knowledge questions	27	100%	8.7	0.5–147.3	0.14			
Not responding correctly to the 5 HIV related knowledge questions	157	86.6%	1					
Aware that confidential HIV testing is available								
Yes	68	88.3%	0.8	0.3–2.0	0.61			
No	96	90.6%	1					
Alcohol use in the past 4 weeks								
Yes	113	86.3%	0.5	0.2–1.4	0.20			
No	64	92.8%	1					
Number of female sex workers you had sex with in the last 12 months								
1 or 2	66	83.5%	1			1		
3 or more	111	91.7%	2.2	0.9–5.1	0.08	2.4	0.9–5.9	0.07
Number of sexual contacts with sex workers in the last month								
0–1	85	93.4%	1			1		
2 or more	92	84.4%	0.4	0.2–1.0	0.06	0.5	0.1–1.4	0.17
Reported ever having genital ulcers or discharge in the last 12 months								
Yes	22	78.6%	1					
No	155	90.1%	3.6	1.2–11.2	0.024	1.1	0.23–5.23	0.90
Have you ever had an HIV test previously?								
Yes	15	100%	4.5	0.3–77.2	0.304			
No	70	87.7%	1					

Discussion

This study found high levels of self-reported condom use at last FSW contact (88.5%), but low levels of reporting ever having received HIV testing (8.11%). The high condom use might be due to the fact that condoms were easily accessible in these brothels, either from the kiosks nearby or at reception. In fact, HIV interventions targeted at FSWs in brothel settings also provide condoms free of charge to the women, which they use in commercial sex transactions. No variables were associated with reported condom use at last sex with a FSW, indicating there might be other factors not identified in this study that could influence condom use in this setting, such as an emotional involvement in the relationship with the FSW (Milrod & Monto, 2016) or attitudes towards gender issues (Decker et al., 2010).

The high percentage of reported condom use at last sex with a FSW is consistent with findings from the national Indonesian IBBS (2011) i.e., 60.6% (Indonesian Ministry of Health, 2011). However, the current study contradicts findings from two studies conducted more

than two decades ago in this setting, i.e., a study by Fajans et al. that found only 8.5% of MWPS reported condom use during their most recent sex purchase (Fajans, Wirawan, & Ford, 1994), and Ford et al.'s study that found only 32% of condom use at the last paid sex (Ford, Nyoman Wirawan, & Muliawan, 2002). The result of the present study suggests the success of various HIV interventions in this setting, particularly condom promotion in brothel areas, in influencing condom use among MWPS, as has also been seen in India (Lipovsek et al., 2010).

The low level of HIV testing reported among participants was consistent with a finding from the Indonesian IBBS (2011), a national survey conducted among men from occupational groups designated as a proxy for MWPS, with the sample size ranging from 300 to 400 and selected with two-stage proportionate probability and time location sampling. That IBBS found a HIV testing rate of 7% among these men (Indonesian Ministry of Health, 2011). This finding has concerning implications, since studies in other countries have found higher rates of HIV testing among this group, ranging from 16% to

Table 3. Bivariate and multivariate analysis of associated factors of history of HIV testing.

Variables	Reported a history of HIV testing		Bivariate analysis			Multivariate analysis		
	<i>n</i>	%	OR	95%CI	<i>p</i> values	OR	95%CI	<i>p</i> values
Age								
24 years old and below	1	3%	0.5	0.08–2.6	0.38	0.1	0.005–1.57	0.1
25 years and above	12	8.9%	1					
Highest level of education								
Primary or junior high school	5	5.7%	1					
senior high school or above	10	10.5%	1.9	0.6–5.5	0.26	1.1	0.11–11.7	0.9
Current marital status								
Not married	5	7.8%	1					
Currently married	10	8.3%	1.01	0.3–3.0	0.97			
Do you perceive yourself at risk of contracting HIV?								
Probably at risk, not at all/not sure	4	3.9%	1					
High risk	11	13.6%	3.6	1.2–11.3	0.03	13.2	2.16–81	0.005
Do you perceive HIV as a serious disease?								
Not at all, not too sure, not too serious	2	2.8%	1			1		
Very serious	13	11.4%	3.7	0.93–14.7	0.064	7.8	0.2–271.01	0.26
Knowledge about HIV transmission								
Responding correctly to the 5 HIV related knowledge questions	10	37.0%	16.6	5.3–52.2	<0.001	24.5	5.05–118.96	<0.001
Not responding correctly to the 5 HIV related knowledge questions	5	3.2%	1			1		
Aware that confidential HIV testing is available								
Yes	15	19.5%	52.9	3.1–898.19	<0.001	54.5	2.68–1108.09	0.009
No	0	0	1			1		
Alcohol use in the past 4 weeks								
Yes	6	4.9%	0.3	0.1–0.9	0.03	0.8	0.1–5.1	0.8
No	9	14.3%	1					
Number of female sex workers you had sex with in the last 12 months								
1 or 2	10	12.7%	1					
3 or more	5	4.7%	0.4	0.1–1.1	0.06	0.5	0.1–2.9	0.43
Number of sexual contacts with sex workers in the last month								
0–1	4	4.9%	1					
2 or more	11	10.6%	2.1	0.7–6.6	0.19			
Reported ever having genital ulcers or discharge in the last 12 months								
Yes	5	19.2%	3.64	1.2–11.2	0.02	14.3	2.2–91.7	0.005
No	10	6.3%	1			1	1	
Condom use in the last sex with brothel-based sex workers								
Yes	15	9.2%	4.5	0.3–77.2	0.30			
No/can't remember	0	0	1					

74% (Darling et al., 2012; Fleming et al., 2016; Lau & Tsui, 2003; Milrod & Monto, 2016; Niccolai et al., 2012; Rana et al., 2013).

The contrast between the low rate of HIV testing and high condom use might also signal the roles that confidentiality and convenience play in men's decision to adopt health prevention measures. While condoms can be readily accessed in this setting without men having to visit an STD clinic, this was not the case with HIV testing, which can now only be provided at Voluntary HIV Counselling and Testing (VCT) clinics, albeit free of charge. Numerous studies have reported the confidentiality concerns that contribute to a reluctance to visit VCT clinics. For example, a previous study of injecting drug users, conducted in this setting, found fear about the stigma of HIV was a main concern of respondents who avoided HIV testing at the clinic (Ford, Wirawan, Sumantera, Sawitri, & Stahre, 2004). A qualitative study in South Africa revealed the acceptability of an oral HIV test, particularly to male participants who selected “nobody saw me” and convenience as the

main reasons to accept HIV self-testing (Martínez Pérez et al., 2016), suggesting that an HIV self-testing option could be evaluated in this setting as another strategy that encourages men to be tested for HIV.

Men with a good knowledge of HIV, or who perceived themselves to be at high risk of HIV were more likely to have ever been tested. It is acknowledged that perceived risk and HIV knowledge may have been the result of having been tested for HIV. Being a cross-sectional study, it is unlikely to be able to identify whether the responses to these items were as a result of, or resulted in, testing experience. However, these findings suggest the need for education formats that address men's knowledge of HIV and the perceived risks in order to influence their willingness to be tested for HIV in future.

Men who reported a history of genital ulcers or discharge in the past 12 months were more likely to report a previous HIV test. This finding might suggest that men with an STI symptom who had sought treatment at a health facility, i.e a clinic-based STI test, were more likely to have an HIV test, which indicates the need for more

community-based testing. Such an approach could reach higher testing coverage than facility-based approaches (Suthar et al., 2013).

The association between HIV testing and awareness of the availability of confidential HIV testing echoes calls for strategies that assure MWPS of confidentiality in accessing tests. Campaigns to increase awareness of confidential HIV testing services might improve HIV testing rates. It might also highlights the potential of HIV self-testing strategy in ensuring privacy and confidentiality (Krause, Subklew-Sehume, Kenyon, & Colebunders, 2013), which would probably increase the uptake of HIV testing in the current setting. Due to possible issues around HIV self-testing (Wood, Ballenger, & Stekler, 2014), perhaps future studies in this setting should seek information on innovative venues for accessing HIV testing or self-testing before the latter is considered, and also seek information on clients' needs for counselling services and links to care strategies.

As in many areas of health behavioural research, the reliance on self-reporting in surveys of sexual behaviour raises difficulties in drawing validated conclusions from study findings (Fenton, Johnson, McManus, & Erens, 2001; Ross, 2010), particularly due to social desirability issues (DiFranceisco, McAuliffe, & Sikkema, 1998) and recall bias (Schick, Calabrese, & Herbenick, 2014). Second, the current study involves self-reporting on the "culturally immoral behaviour" of sexual contact with FSWs. Reluctance to admit to this type of behaviour due to stigma has been acknowledged in previous studies (Morison et al., 2001; Morris, 2004). This might have an impact on the responses and participation rates. Third, the use of a sampling technique to recruit participants, by approaching only MWPS who presented at brothels, might result in a questionable representativeness of MWPS in the population, particularly among MWPS who access non-brothel-based venues such as massage parlours, spas, karaoke bars, clubs and bars, and introduces unknown bias. However, due to the stigma attached to this behaviour, MWPS are a difficult group to reach (Crael, Slaymaker, Lyerla, & Sarkar, 2006); therefore, this sampling approach is a practical strategy (Magnani, Sabin, Saidel, & Heckathorn, 2005). Our response rate, of about 50%, reflects the practical benefits of approaching MWPS by this method.

The non-random technique used to recruit participants might also introduce issues of external validity – a challenge often faced by studies targeting hard-to-reach populations (Schick et al., 2014). However, a sampling frame is rarely available for this hidden population, and so a non-random sampling technique might be more useful (Crosby, Salazar, DiClemente, & Lang,

2010). Last but not least, the small sample of $n = 15$ men who were ever HIV tested might be considered a limitation. Despite the choice of a statistical test that might match the data, there is still a wide confidence interval, which may indicate the low power of this study. Results of this outcome should thus be presented more as a pilot study rather than one that conclusions can be drawn from.

Conclusions

The current study is valuable in its attempt to shed light on the extent of condom use and HIV testing among MWPS. This study also begins to bridge a gap in the literature, with its dearth of important information on associated factors of HIV testing among MWPS in Indonesia. This study found very high levels of self-reported condom use at last sex with a FSW (88.5%), but low levels of reporting ever having received HIV testing (8.11%). It also noted an association between HIV testing and awareness of confidential HIV testing, findings that both suggest a need to improve awareness of the availability of confidential HIV testing or the introduction of HIV testing options that ensure convenience and confidentiality. HIV self-testing might offer a solution to this issue, and this may be considered by future studies that look at the acceptability of oral HIV self-testing in this setting.

Acknowledgment

This study was a collaboration of Udayana University, Bali and the Kirby Institute at UNSW, with funding from Udayana University International Collaboration Research Grant (Skim Riset Kerjasama Luar Negeri). This study is also part of Luh Putu Lila Wulandari's PhD thesis, undertaken with the support of the Australia Awards Scholarship and funding from the Australian Department of Foreign Affairs and Trade. John Kaldor is the holder of an NHMRC Research Fellowship. We acknowledge Yayasan Kerti Praja, field workers and participants involved in this study. We also acknowledge the role of UNSW Research Training Statistical Consulting Services for their advice on the quantitative analysis of this study.

Disclosure statement

No potential conflict of interest was reported by the authors.

ORCID

Luh Putu Lila Wulandari  <http://orcid.org/0000-0002-3397-3648>

References

- Alary, M., Lowndes, C. M., Mukenge-Tshibaka, L., Gnintoungbe, C. A., Bedard, E., Geraldo, N., ... Anagonou, S. (2003). Sexually transmitted infections in male clients of female sex workers in Benin: Risk factors and reassessment of the leucocyte esterase dipstick for screening of urethral infections. *Sexually Transmitted Infections*, 79(5), 388–392.
- Altman, D. G., & Bland, J. M. (2007). Missing data. *BMJ*, 334 (7590), 424–424. doi:10.1136/bmj.38977.682025.2C
- Carael, M., Slaymaker, E., Lyerla, R., & Sarkar, S. (2006). Clients of sex workers in different regions of the world: Hard to count. *Sexually Transmitted Infections*, 82(Suppl. 3), iii26–iii33. doi:10.1136/sti.2006.021196
- Couture, M. C., Soto, J. C., Akom, E., Labbe, A. C., Joseph, G., & Zunzunegui, M. V. (2008). Clients of female sex workers in Gonaives and St-Marc, Haiti characteristics, sexually transmitted infection prevalence and risk factors. *Sexually Transmitted Diseases*, 35(10), 849–855. doi:10.1097/OLQ.0b013e318177ec5c
- Coveney, J. (2015). Firthlogit: Stata module to calculate bias reduction in logistic regression. Retrieved from <http://EconPapers.repec.org/RePEc:boc:bocode:s456948>
- Crosby, R. A., Salazar, L. F., DiClemente, R. J., & Lang, D. L. (2010). Balancing rigor against the inherent limitations of investigating hard-to-reach populations. *Health Education Research*, 25(1), 1–5. doi:10.1093/her/cyp062
- Darling, K. E., Diserens, E. A., N'Garambe, C., Ansermet-Pagot, A., Masserey, E., Cavassini, M., & Bodenmann, P. (2012). A cross-sectional survey of attitudes to HIV risk and rapid HIV testing among clients of sex workers in Switzerland. *Sexually Transmitted Infections*, 88(6), 462–464. doi:10.1136/sextrans-2012-050489
- Decker, M., Miller, E., Raj, A., Saggurti, N., Donta, B., & Silverman, J. (2010). Indian men's use of commercial sex workers: Prevalence, condom use, and related gender attitudes. *JAIDS Journal of Acquired Immune Deficiency Syndromes*, 53(2), 240–246.
- DiFranceisco, W., McAuliffe, T. L., & Sikkema, K. J. (1998). Influences of survey instrument format and social desirability on the reliability of self-reported high risk sexual behavior. *AIDS and Behavior*, 2(4), 329–337. doi:10.1023/A:1022674125756
- Fajans, P., Wirawan, D. N., & Ford, K. (1994). STD knowledge and behaviours among clients of female sex workers in Bali, Indonesia. *AIDS Care*, 6(4), 459–475. doi:10.1080/09540129408258661
- Fenton, K. A., Johnson, A. M., McManus, S., & Erens, B. (2001). Measuring sexual behaviour: Methodological challenges in survey research. *Sexually Transmitted Infections*, 77(2), 84–92. doi:10.1136/sti.77.2.84
- Fleming, P. J., Patterson, T. L., Chavarin, C. V., Semple, S. J., Magis-Rodriguez, C., & Pitpitan, E. V. (2016). Behavioral and psychosocial correlates of HIV testing among male clients of female sex workers in Tijuana, Mexico. *AIDS and Behavior*, 1–10. doi:10.1007/s10461-016-1531-6
- Ford, K., Nyoman Wirawan, D., & Muliawan, P. (2002). Social influence, AIDS/STD knowledge, and condom use among male clients of female sex workers in Bali. *AIDS Education and Prevention*, 14(6), 496–504. doi:10.1521/aeap.14.8.496.24113
- Ford, K., Wirawan, D. N., Sumantera, G. M., Sawitri, A. A. S., & Stahre, M. (2004). Voluntary HIV testing, disclosure, and stigma among injection drug users in Bali, Indonesia. *AIDS Education and Prevention*, 16(6), 487–498. doi:10.1521/aeap.16.6.487.53789
- Heinze, G., & Schemper, M. (2002). A solution to the problem of separation in logistic regression. *Statistics in Medicine*, 21, 2409–2419.
- The HIV Cooperation Program for Indonesia. (2015). *Reducing risk behaviours among fishermen and port workers in Bali*. Retrieved from Jakarta: https://www.burnet.edu.au/system/asset/file/1433/reducingg_2A.pdf
- Hor, L. B., Detels, R., Heng, S., & Mun, P. (2005). The role of sex worker clients in transmission of HIV in Cambodia. *International Journal of STD & AIDS*, 16(2), 170–174. doi:10.1258/0956462053057567
- Indonesian Ministry of Health. (2011). *Indonesia Intergrated Biological and Behavioural Survey (IBBS) 2011*. Retrieved from Jakarta: <http://www.aidsdatahub.org/taxonomy/term/448>
- Indonesian National AIDS Commission. (2010). *National HIV and AIDS strategy and action plan 2010–2014*. Retrieved from Jakarta: <http://www.aidsdatahub.org/indonesiaE280%99s-national-aids-strategy-and-action-plan-2010-2014-ministry-of-health-indonesia-2010>
- Krause, J., Subklew-Sehume, F., Kenyon, C., & Colebunders, R. (2013). Acceptability of HIV self-testing: A systematic literature review. *BMC Public Health*, 13(1), 735. doi:10.1186/1471-2458-13-735
- Lau, J. T. F., & Tsui, H. Y. (2003). Behavioral surveillance surveys of the male clients of female sex workers in Hong Kong: Results of three population-based surveys. *Sexually Transmitted Diseases*, 30(8), 620–628. doi:10.1097/01.OLQ.0000081393.94426.B4
- Lipovsek, V., Mukherjee, A., Navin, D., Marjara, P., Sharma, A., & Roy, K. P. (2010). Increases in self-reported consistent condom use among male clients of female sex workers following exposure to an integrated behaviour change programme in four states in southern India. *Sexually Transmitted Infections*, 86(Suppl. 1), i25–i32. doi:10.1136/sti.2009.038497
- Lowndes, C. M., Alary, M., Gnintoungbe, C. A., Bedard, E., Mukenge, L., Geraldo, N., ... Anagonou, S. (2000). Management of sexually transmitted diseases and HIV prevention in men at high risk: Targeting clients and non-paying sexual partners of female sex workers in Benin. *AIDS*, 14 (16), 2523–2534.
- Magnani, R., Sabin, K., Saidel, T., & Heckathorn, D. (2005). Review of sampling hard-to-reach and hidden populations for HIV surveillance. *AIDS*, 19(Suppl. 2), S67–S72.
- Martell, A. N. (2014). *Association of HIV testing, educational attainment, and age among black and non-black men*. University of Kentucky. Retrieved from https://uknowledge.uky.edu/cgi/viewcontent.cgi?referer=https://www.google.com.au/&httpsredir=1&article=1020&context=cph_etds
- Martínez Pérez, G., Cox, V., Ellman, T., Moore, A., Patten, G., Shroufi, A., ... Ibeto, M. (2016). “I know that I do have HIV but nobody saw me”: Oral HIV self-testing in an informal settlement in South Africa. *PLoS ONE*, 11(4), e0152653. doi:10.1371/journal.pone.0152653

- Milrod, C., & Monto, M. (2016). Condom use, sexual risk, and self-reported STI in a sample of older male clients of heterosexual prostitution in the United States. *American Journal of Men's Health*, 10(4), 296–305.
- Morison, A. L., Weiss, J. H., Buvé, J. A., Caraël, J. M., Abega, J. S. C., Kaona, J. F., ... Hayes, J. R. (2001). Commercial sex and the spread of HIV in four cities in sub-Saharan Africa. *AIDS*, 15(Suppl 4), S61–S69.
- Morris, M. (2004). *Network epidemiology a handbook for survey design and data collection*. Oxford: Oxford University Press.
- Mustikawati, D., Morineau, G., Nurhayati, Irmaningrum, Y., Riono, P., Priohutomo, S., & Magnani, R. (2009). Sexual risk taking, sexually transmitted infections and HIV prevalence among four “high-risk” occupational groups of Indonesian men. *Sexually Transmitted Infections*, 85(5), 391–396. doi:10.1136/sti.2008.035097
- Nadol, P., Hoang, T. V., Le, L., Nguyen, T. A., Kaldor, J., & Law, M. (2017). High HIV prevalence and risk among male clients of female sex workers in Hanoi and Ho Chi Minh City, Vietnam. *AIDS and Behavior*, 1–13. doi:10.1007/s10461-017-1751-4
- Niccolai, L. M., Odinkova, V. A., Safiullina, L. Z., Bodanovskaya, Z. D., Heimer, R., Levina, O. S., & Rusakova, M. M. (2012). Clients of street-based female sex workers and potential bridging of HIV/STI in Russia: Results of a pilot study. *AIDS Care*, 24(5), 665–672. doi:10.1080/09540121.2011.630356
- Rana, M. S., Nepali, B., Sathian, B., Aryal, R. P., Thapalia, M., & Bhatta, D. R. (2013). The socio-demographic characteristics of the clients of female sex workers and their perspectives, behaviours and attitude on HIV and AIDS: A questionnaire based survey from Pokhara, Nepal. *Journal of Clinical and Diagnostic Research*, 7(1), 112–117.
- Reilly, K. H., Wang, J., Zhu, Z., Li, S. C., Yang, T., Ding, G., ... Wang, N. (2012). HIV and associated risk factors among male clients of female sex workers in a Chinese border region. *Sexually Transmitted Diseases*, 39(10), 750–755.
- Ross, D. A. (2010). Behavioural interventions to reduce HIV risk: What works? *AIDS*, 24, S4–S14. doi:10.1097/01.aids.0000390703.35642.89
- Rye, B. J., Glenn, J. M., & William, A. F. (2010). *Sexual opinion survey. Handbook of sexuality-related measures*. London: Routledge.
- Schick, V., Calabrese, S. K., & Herbenick, D. (2014). *Survey methods in sexuality research. APA handbook of sexuality and psychology*. Washington, DC: American Psychological Association.
- Shaw, S. Y., Bhattacharjee, P., Isac, S., Deering, K. N., Ramesh, B. M., Washington, R., ... Blanchard, J. F. (2013). A cross-sectional study of sexually transmitted pathogen prevalence and condom use with commercial and noncommercial sex partners among clients of female sex workers in southern India. *Sexually Transmitted Diseases*, 40(6), 482–489. doi:10.1097/OLQ.0b013e3182904a9a
- StataCorp. (2015). T. S. L. College Station.
- Suthar, A. B., Ford, N., Bachanas, P. J., Wong, V. J., Rajan, J. S., Saltzman, A. K., ... Baggaley, R. C. (2013). Towards universal voluntary HIV testing and counselling: A systematic review and meta-analysis of community-based approaches. *PLoS Medicine*, 10(8), e1001496. doi:10.1371/journal.pmed.1001496
- UNAIDS. (2015). *UNAIDS terminology guidelines*. Retrieved from http://www.unaids.org/sites/default/files/media_asset/2015_terminology_guidelines_en.pdf
- UNAIDS. (2016a). Country: Indonesia. Retrieved from UNAIDS <http://www.unaids.org/en/regionscountries/countries/indonesia>
- UNAIDS. (2016b). Indonesia : Number of people living with HIV. Retrieved from UNAIDS: <http://www.unaids.org/en/regionscountries/countries/indonesia>
- van Haastrecht, H. J., Fennema, J. S., Coutinho, R. A., van der Helm, T. C., Kint, J. A., & van den Hoek, J. A. (1993). HIV prevalence and risk behaviour among prostitutes and clients in Amsterdam: Migrants at increased risk for HIV infection. *Genitourinary Medicine*, 69(4), 251–256.
- Wood, B. R., Ballenger, C., & Stekler, J. D. (2014). Arguments for and against HIV self-testing. *HIV/AIDS (Auckland, N.Z.)*, 6, 117–126. doi:10.2147/HIV.S49083
- World Health Organization and UNAIDS. (2015). *Global AIDS response progress reporting 2015*. Geneva: UNAIDS.