

Access to HIV Prevention Services and Attitudes about Emerging Strategies

A Global Survey of Men Who Have Sex with Men (MSM)
and their Health Care Providers



July 2011



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The Global Forum on MSM and HIV (MSMGF)

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Executive Summary

With rates of HIV infection among gay men and other men who have sex with men (MSM) rising globally, public health and advocacy organizations have called for a combination of HIV prevention and treatment packages targeting MSM. This combination approach for HIV prevention integrates scale-up of behavioral interventions, promising biomedical interventions, and community-level/structural approaches. Gaining prominence in this dialogue has been the potential of novel biomedical HIV prevention strategies including pre-exposure prophylaxis (PrEP) and rectal microbicide gels.

PrEP is the first biomedical HIV prevention intervention that has shown efficacy in reducing HIV risk among MSM. Thus, it has been welcomed with much excitement and interest. As PrEP efficacy trials are implemented in various parts of the world, it is important to examine attitudes about emerging prevention technologies among MSM in the context of present-day gaps in access to proven and basic HIV prevention services. We must ensure that MSM have a meaningful place in the dialogue about shaping the future of HIV prevention to fully realize the potential of both existing and emerging prevention interventions.

With this in mind, the Global Forum on MSM and HIV (MSMGF) sought to amplify the voices of MSM from around the world and highlight key gaps in global efforts to provide MSM with evidence-informed HIV prevention services. We also wanted to supply MSM and their providers with information and tools that MSM need to stay healthy. In order to do this, the MSMGF implemented a global online survey of MSM and their health care providers through our extensive global networks. The survey focused on obtaining information on access to and participation in HIV prevention services; knowledge and attitudes about PrEP and other emerging prevention interventions; and perceptions about external and internalized homophobia.

The survey was conducted from 24 June through 17 August, 2010. In total, 5,066 MSM and providers accessed and completed the online survey in English, Spanish, French, Russian, or Chinese. The majority of surveys were completed in English (46%) or Chinese (40%). A large proportion (56%) of survey respondents reported being from Asia-Pacific (ie, Central, East, South, Southeast Asia, and the Pacific Islands), 14% from North America, 11% from Central/South America and the Caribbean, 7% from

Australia/New Zealand, 6% from Europe (Western and Eastern Europe), 4% from Africa (North, Western, Eastern, and Southern Africa), and 1% from the Middle East. The mean age of participants was 34.3 years (range: 14-86 years). The majority of participants were male (96%). Over 1,000 participants (21% of the sample) were health providers. Most (71%) participants reported being HIV-negative, while 22% reported being HIV-positive.

Measures used in the survey represented the following twelve key topic areas: 1) perceived stigma/external homophobia, 2) internalized homophobia, 3) self-esteem, 4) access to basic HIV prevention services, 5) access to emerging HIV prevention technologies, 6) knowledge of emerging prevention strategies, 7) desire to learn about emerging prevention strategies, 8) PrEP knowledge, 9) attitudes about PrEP, 10) participation in HIV prevention activities, 11) exposure to HIV prevention messages, and 12) venues in which HIV prevention materials were obtained.

We analyzed the collected data in several stages: creating summary variables (using means and total scores) for the twelve key measures; examining group differences (ie, region and age) on each of the key twelve constructs measured in the survey using analysis of variance; and conducting multivariate analyses to examine independent predictors of access to and participation in HIV prevention services.

In this global survey, we observed that access to basic HIV prevention services—including free condoms, condom-compatible lubricants, and HIV behavioral and education interventions—was not widespread among MSM. There were considerable regional variations in access to and participation in HIV prevention with the lowest rates found in Asia-Pacific, the Middle East, Africa, and Central/South America or the Caribbean (ie, non-high-income regions outside of North America, Europe, and Australia/New Zealand).

In addition, our data suggests that young MSM lack access to HIV prevention services and have less knowledge of prevention strategies compared to older populations. This is highly problematic, particularly given the increases in HIV prevalence and incidence among young MSM globally.

Our data also showed that MSM and their health providers had feelings of apprehension and lack of clarity around emerging HIV prevention strategies, such as PrEP. Across regions, knowledge of PrEP and other emerging strategies was low; participants, on average, answered only 2 out of the 6 PrEP knowledge items correctly. These findings are somewhat understandable since administration of this survey from June to August of 2010 preceded the public release in December 2010 of the findings from

the first PrEP MSM efficacy study, iPrEx. Importantly, these feelings of apprehension and gaps in knowledge were balanced by a strong desire to learn more about emerging strategies. Addressing these gaps in knowledge among MSM will be critical during the roll-out of PrEP and other biomedical interventions outside of research settings.

In addition, the MSM in our sample reported disparate rates of stigma and homophobia between regions, which was significantly associated with low access to basic HIV prevention strategies in our analysis. Participants from numerous regions reported alarming levels of external homophobia, with participants from Africa reporting the highest levels of external homophobia, followed by the Caribbean and Central/South America, Asia-Pacific, and the Middle East. North America, Europe and Australia/New Zealand had the lowest levels of external homophobia, in descending order. In regions where external homophobia is high, efforts to combat the social stigma and discrimination are needed to reduce the barriers to critical HIV prevention services.

The findings of the survey point to four key recommendations for public health systems, HIV/AIDS advocates and providers, and researchers:

1. Given the documented effectiveness of basic HIV prevention strategies, more must be done to engender universal access to basic HIV prevention among MSM in all parts of the world, most notably the Middle East and Asia-Pacific. In order to contain HIV transmission successfully, vigilance and sustained efforts are needed to ensure that MSM have access to a comprehensive set of prevention strategies.
2. Targeted information campaigns are needed to promote awareness of PrEP and other emerging strategies among MSM and their providers prior to implementing these strategies. Doing so will likely increase acceptability of PrEP and make it a more feasible public health intervention.
3. Stigma surrounding homosexuality and gay men that impedes health-seeking behaviors and access to health services must be addressed. Structural conditions, such as external homophobia and stigma, must be addressed in order to promote unfettered access to HIV prevention services that can increase the health of MSM communities worldwide.
4. Focused attention on the HIV prevention needs of young MSM is essential. Across regions of the globe, young MSM report lower access to basic and emerging prevention strategies, and have lower knowledge of these strategies, compared to older MSM. Given the rising rates of new HIV infections among young MSM, it imperative to alleviate this health access disparity.

I. Introduction

Gay men and other men who have sex with men (MSM) are disproportionately affected by HIV worldwide. MSM are estimated to have 19.3 times higher odds of having an HIV-infection than the general population in low- and middle-income countries.¹ Increasing HIV infections among MSM have also been documented in high-income regions like North America, Western Europe, and Australia, where MSM account for the bulk of new infections.² The Joint United Nations Programme on HIV/AIDS (UNAIDS) estimates that sex between men may account for up to 10% of all HIV infections worldwide.³

Additionally, MSM face a multitude of other challenges that negatively affect their health, including social stigma and discrimination. Sexual activity between two consenting adults of the same sex is currently criminalized in nearly 80 countries. Many MSM experience hostility, harassment and violence from their family and peers, which have been linked to heightened risk for self-harm, unsafe sexual behaviors, suicidal thoughts, and substance use.^{1, 4} Homophobia, stigma, discrimination, and criminalization also impede and undermine access to HIV-related services, further fueling the HIV pandemic among MSM.⁵

Given the myriad issues confronting MSM, there is a growing recognition that combination approaches—packages that implement biomedical, behavioral strategies, community-level and structural interventions together—are needed.^{6, 7, 8} Combining prevention approaches is important because a singular focus on an individual, group, community, or structural factor that increase HIV transmission will not result in significant, long term HIV prevention gains. For example, MSM will not get the maximum benefits from behavioral or biomedical interventions if serious inequities in basic healthcare access persist or if resources are underutilized because of social isolation that stems from stigma, discrimination, or criminalization.⁶

Availability of HIV prevention services

Despite the high HIV disease burden experienced by MSM globally, only an estimated 1.2% of all HIV prevention funding is targeted toward MSM.⁹ HIV prevention services reach only 1 in 10 MSM worldwide and, distressingly, the poor penetration of proven, basic HIV prevention and related services for MSM is most apparent in low- and middle-income countries.^{10, 11} In these resource-limited regions, estimates show that only 31% of MSM tested for HIV in the past 12 months; 33% had access to

information about HIV; 44% had accurate knowledge about HIV; and only 54% used condoms the last time they had anal sex with another man.¹² In some regions, HIV prevention messages have focused exclusively on heterosexual transmission, leading to misconceptions that sex between men carries little or no risk for HIV transmission.^{13, 14} To date, three decades into the HIV pandemic, the scale-up and delivery of basic strategies and interventions proven to reduce HIV transmission remain poor for MSM, particularly outside of high-income countries.

In the last few years, novel biomedical interventions have been demonstrated to efficaciously reduce HIV transmission; a growing body of evidence show the promising utility of antiretroviral medications (ARVs), topical microbicide gels, and circumcision in preventing new HIV infections. The distribution and implementation of these biomedical interventions alongside other basic HIV prevention methods with strong evidence base (eg, condoms, condom-compatible lubricants, HIV behavioral and educational interventions) will further strengthen efforts to control the spread of HIV infections.

Use of ARVs as an HIV prevention strategy has been evaluated among different populations. Researchers and health care providers treating women living with HIV and their newborns with ARVs have greatly reduced the risk of maternal to child HIV transmission by over 90%.¹⁵ Smith and colleagues¹⁶ have shown that ARVs lower the risk of HIV infection if given within 72 hours as post-exposure prophylaxis (PEP) to persons exposed to blood or fluids of a person known to be living with HIV. When HIV-positive heterosexuals are treated with ARVs, the likelihood of HIV sexual transmission to their HIV-negative partner is greatly reduced according to epidemiologic and experimental evidence from the HPTN 052 clinical trial.¹⁷ Abdool Karim and colleagues¹⁸ have demonstrated that a topical vaginal microbicide gel containing the ARV tenofovir reduces the risk of HIV infection among women. Lastly, research is being conducted to examine if rectal microbicide gels containing ARVs would be effective in preventing HIV; the Microbicide Trials Network (MTN) 017 study will begin testing rectal microbicides in 2012 with study sites in Peru, Thailand, South Africa and the United States.¹⁹

Recently, ARVs given to HIV-negative individuals prior to exposure—PrEP—have been shown to effectively reduce the risk of acquiring HIV among MSM and transgender females in one randomized controlled trial, iPrEx. This study was conducted among nearly 2,500 MSM and transgender women in Brazil, Ecuador, Peru, South Africa, Thailand and the United States. The iPrEx study found that the use of PrEP was associated with a 44% reduction in HIV infection when administered with a package of comprehensive HIV prevention strategies including condoms, HIV and STI testing, and risk-reduction counseling.²⁰ Another trial on the efficacy of PrEP among women was discontinued early because it

became clear that PrEP could not be proven to reduce new HIV infections among women who participated in this trial.²¹ Other PrEP efficacy and feasibility trials are currently underway among multiple populations across regions of the globe, including the Partners PrEP trial in Kenya and Uganda and the CDC 4370 trial in Thailand.

The result from iPrEx's PrEP study is the first ever biomedical intervention that has been evaluated and shown to be effective among MSM, a group with disproportionate burden of HIV since the inception of the pandemic. Thus, the use of PrEP as a prevention strategy has been received with great attention and excitement from public health systems, HIV/AIDS advocacy and community groups, and media. Many stakeholders agree that PrEP could be recommended for individuals at high risk for exposure to HIV, which may include MSM, injection drug users (IDUs), ethnic minority populations, and other vulnerable groups. The strong interest in PrEP has led many public health organizations to comment on the iPrEx findings and provide support with regard to implications of the findings.¹⁶ To understand if PrEP will be a feasible and acceptable intervention strategy for MSM, comprehensive research must be conducted to assess knowledge, attitudes, and beliefs regarding PrEP's use from MSM and their health care providers. Additionally, it is important to measure the level of coverage and assess gaps in existing proven HIV prevention services because PrEP and other biomedical strategies will likely be implemented as part of a comprehensive package alongside these existing strategies,

Report Aims

The Global Forum on MSM and HIV (MSMGF) sought to explore the perceptions that MSM and their health care providers have regarding emerging HIV prevention strategies, and to describe the factors related to access to proven basic prevention strategies. While biomedical strategies are being considered, it is also important to evaluate the extent to which proven HIV prevention strategies have been disseminated to and are accessible by MSM around the globe.

The goals of this report are: 1) to provide a platform for MSM voices from around the globe, helping to ensure their inclusion in discussions about HIV prevention for their own communities; 2) to highlight key gaps in efforts to provide MSM with basic HIV prevention services; 3) assess predictors of access and participation for those services; and 4) to identify potential challenges and issues that warrant further attention as we roll out emerging prevention strategies. In doing so, the MSMGF strives to promote the health and wellness of MSM and their communities worldwide.

2. Survey Measures

Measures used in the survey represented twelve key topic areas: 1) perceived stigma/external homophobia, 2) internalized homophobia, 3) self-esteem, 4) access to basic HIV prevention services, 5) access to emerging HIV prevention technologies, 6) knowledge of emerging technologies, 7) desire to learn about emerging technologies, 8) PrEP knowledge, 9) attitudes about PrEP, 10) participation in HIV prevention activities, 11) exposure to HIV prevention messages, and 12) venues in which HIV prevention materials were obtained. The methods used to develop these measures, their components, and their internal consistency are described in the appendix section of this report. Data on demographic characteristics, HIV-testing history, self-reported HIV-status and sexual behaviors were also collected.

3. Sample Characteristics

The sample used for this project is composed of a diverse group of gay men, other MSM, and healthcare providers who work with MSM. MSM and providers who participated in the survey were recruited via the MSMGF's extensive networks and ties to community-based, advocacy, health, and social service organizations. Email blasts were sent out through these networks with a link to the SurveyMonkey.com website address, which housed the survey. In total, 5,066 persons accessed the survey and completed questions from 24 June through 17 August, 2010.

The majority (70%) of participants found out about the survey through an email message. Smaller numbers reported finding out about the survey through a listserv (9%), the MSMGF website (5%), an advertisement (5%), an organization the participant worked or volunteered at (4%), or word of mouth/referral from another person (3%).

The majority of the surveys were completed in English (46%) or Chinese (40%). Approximately 10% of surveys were completed in Spanish, 2% in French, and 1% in Russian. While there was regional diversity in the sample, a large portion (56%, or 2,822) reported being from Asia-Pacific (ie, Central, East, South, Southeast Asia, and the Pacific Islands). Fourteen percent (708) were from North America, 11% (528) from Central/South America or the Caribbean, 7% (374) from Australia/New Zealand, 6% (304) from Europe (Western and Eastern Europe), 4% (214) from Africa (North, Southern, Eastern, and Western Africa), and 1% (52) from the Middle East. These regional categories were grouped from additional sub-regional categories. When the survey was administered, participants were asked to select their region from the following list: North America, Central America, South America, Caribbean, Western Europe, Eastern Europe, Middle East, Central Asia, South Asia, Southeast Asia, Pacific Islands, Australia, North Africa, Western Africa, Eastern Africa, and Southern Africa. For the purpose of this analysis, these sub-regions were then grouped into the seven larger regions that appear throughout this report: North America, Central/South America and Caribbean, Asia-Pacific (Central, South, and Southeast Asia and the Pacific Islands), Africa (North, Western, Eastern and Southern Africa), Europe (Western and Eastern Europe), Middle East, and Australia and New Zealand.

The mean age of participants was 34.3 years (range: 14-86 years); 21% were between the ages of 14-24 years, 52% between 25-40 years, and 28% between the ages of 41-86. The majority (96%) of participants

were male, while 3% were female, 0.7% were transgender and 0.3% were intersex. Most (79%, or 3,933) participants identified as MSM, the remaining were MSM who were also providers (14% or 718) or providers who were not MSM (7% or 337). In total, 1,055 or 21% of the sample were HIV service providers. Participants described themselves as “gay” (58%), “bisexual” (7%), “heterosexual” (2%), and “other” (33%). Most (71%) of the participants reported that they were HIV-negative; twenty-two percent reported being HIV-positive, 4% did not know their HIV status, and 3% declined to answer. Of those who were HIV-positive, 12% had been diagnosed less than one year prior to taking the survey, 26% had known about their HIV-positive status for 1-5 years, 19% for 6-10 years, 14% for 11-15 years, and 12% between 16-20 years. Sixteen percent of HIV-positive participants reported being diagnosed for 20 years or longer. Seventy-nine percent of HIV-positive participants indicated taking medication (ie, ARVs) to treat their HIV infection.

The sample was diverse with regard to income and housing, and somewhat less so with regard to education. Seventeen percent of survey participants indicated that they had no income or were very low income/impoverished. Large numbers of participants said they were low-middle income/working class (35%) or middle-income/middle class (42%). Only 6% of participants reported being high-income/upper class. The sample was highly educated, with approximately 99% reporting at least a high school education, 61% reporting post-secondary education and 24% reporting post-graduate education. In regard to housing, 76% of participants said they have a stable place to live, while 22% said they have an unstable place to live and 2% indicated they have no place to live.

Most of the survey participants indicated being sexually active. Sixty-seven percent reported having sex with 2 or more partners in the prior year, while 26% reported sex with only 1 partner in the prior year. Eight percent indicated not having had sex in the past year. A majority (53%) of participants identified themselves as “single,” and 32% reported having a male romantic partner. Seven percent indicated being married to a man and 5% were married to a woman. Lastly, most (87%) participants said they had sex with men only, 9% said they had sex with men and women, 2% said they had sex with women only, and 2% said they do not have sex with anyone.

4. Findings

FREQUENCIES FOR ACCESS TO BASIC AND EMERGING HIV PREVENTION SERVICES ITEMS

The frequencies for items on access to basic and emerging HIV prevention services revealed important disparities in the types of services to which participants indicated having access. Of note, there was no single HIV prevention service that a large majority of participants had easy access to. However, some services were endorsed as “easily accessible” more so than others.

Basic HIV prevention services that are recommended by UNAIDS and the World Bank, such as sexually transmitted disease (STD) testing, HIV counseling, and STD treatment, were noted as easily accessible by 53%, 51%, and 47% of participants, respectively. Access to HIV treatment, however, was fairly low, with only 36% reporting it was easily accessible, while 27% said it was “available but almost impossible to access,” “not available,” or that they “never heard of this.” Other basic services such as free condoms and lubricants were easily accessible only to 44% and 29% of participants, respectively. Only about 30% of participants reported easy access to each of the following basic HIV prevention services: behavioral HIV/AIDS interventions, HIV education materials, mental health services, free or low cost medical care, media campaigns focused on reducing HIV, and laws/policies to ensure access to HIV prevention.

Close to half (48%) of participants reported having easy access to free HIV testing; however, sex education programs were not as easily accessible, with only one-quarter indicating these were easily accessible. Media campaigns to reduce homophobia were not widespread, with half of the respondents reporting that anti-homophobia campaigns were either not available (30%) or unheard of (20%). Similarly, health facilities for MSM were not easily accessible, with over half (52%) reporting this was either not available (27%) or unheard of (25%). Access to services for substance use was also low, with only 16% of participants reporting easy access and less than half (43%) reporting *any* access to needle exchange programs. Finally, only about one quarter (24%) of participants indicated that substance abuse treatment programs were easily accessible.

With regard to knowledge and access to **emerging HIV prevention strategies**, in all cases except for circumcision, there was low endorsement of easy access. For example, PEP was described as easily accessible by only 18% of participants. Thirty-five percent noted having never heard of PEP. Similarly, 39% indicated never having heard of PrEP and 44% of MSM had never heard of topical microbicides for HIV prevention. Circumcision represented the one biomedical HIV prevention strategy that many participants could access: 50% reported this was easily accessible and only 10% of participants had not heard of circumcision as a biomedical strategy.

FREQUENCIES FOR ATTITUDES TOWARD PrEP ITEMS

The attitudes toward PrEP items assessed participants' negative and positive views about using PrEP in a variety of domains. These domains included financial, health risk, and sexual risk, among others. Across items the key finding was the lack of opinion and information that participants had about PrEP. For most items, the largest proportion (37-64%) of responses to items was "I don't know." This finding is telling because it highlights the dearth of information about PrEP available to participants to aid them in forming an opinion about PrEP. Outside of the prominence of the "I don't know response," other findings were item-specific. For example, 35% of participants agreed (ie, either "strongly" or "somewhat") that PrEP should be used by MSM to prevent HIV infection. However, 30% of participants agreed that PrEP will cost too much money. With regard to safety, it is clear that participants have mixed feelings about PrEP. The majority (64%) reported that they didn't know if PrEP was safe, while 20% did not think it was safe. Fifty-eight percent felt that money should go toward research to better understand PrEP as an HIV prevention strategy for MSM. Roughly four out of ten (38%) participants thought that PrEP will make more MSM not use condoms when they have sex; very few (16%) felt that it had the potential to be a more effective strategy for preventing HIV than condom use.

KEY GROUP COMPARISONS

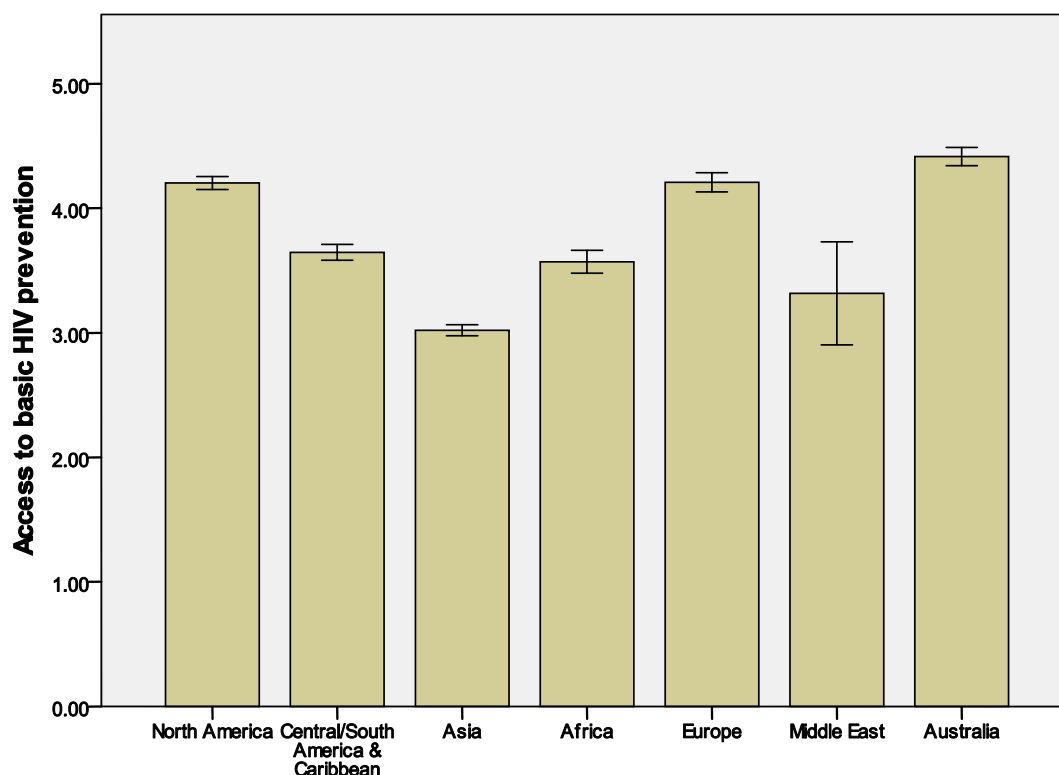
REGION

As shown in Table I below, significant differences by region were found on each of the core constructs. The F-values for each construct can be interpreted in terms of the magnitude of group differences (ie, the larger the F-value, the larger the mean differences among regions). Analysis of variance (ANOVAs) revealed that participants from Africa reported the highest levels of stigma and external homophobia out of all regions. After Africa, the second highest levels of stigma and external homophobia were reported in the Middle East, Asia-Pacific, Central/South America and the Caribbean, which all reported relatively equal levels for these indicators. These regions were followed by Europe and North America, and finally by Australia/New Zealand, which reported the lowest levels of stigma and external homophobia of all regions. With regard to internalized homophobia, men from Africa and Asia-Pacific reported the highest levels of internalized homophobia, with their numbers falling roughly in the same range. Africa and Asia were followed by a group of regions all falling in the middle range of scores, including the Middle East and Central/South America and the Caribbean. The lowest levels of internalized homophobia were found in Europe, North America and Australia/New Zealand. Finally, men from Asia, the Middle East, and Africa scored significantly lower on self-esteem than men from Europe, Australia/New Zealand, North America, and Central/South America and the Caribbean.

TABLE 1: COMPARISONS ON KEY CONSTRUCTS BY REGION

Construct	North America		Central/South America & Caribbean		Asia-Pacific		Africa		Europe		Middle East		Australia/New Zealand		F value	p
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
<i>Perceived homophobia</i> (1-4 ; lowest-highest perceived homophobia)	2.07	0.68	2.59	0.70	2.57	0.71	2.86	0.87	1.99	0.73	2.52	0.80	1.72	0.58	115.16	.000
<i>Internalized homophobia</i> (1-4 ; lowest-highest internalized homophobia)	1.38	0.45	1.54	0.60	1.97	0.68	1.82	0.66	1.33	0.37	1.69	0.60	1.42	0.50	112.46	.000
<i>Self-esteem</i> (1-4 ; lowest-highest self-esteem)	3.79	0.37	3.81	0.33	3.53	0.49	3.68	0.40	3.72	0.45	3.59	0.55	3.75	0.41	40.37	.000
<i>Access to emerging prevention</i> (1-5 ; least-most access)	3.27	1.04	2.48	1.01	2.32	1.08	2.82	0.83	3.04	0.94	2.69	0.92	3.13	1.16	81.53	.000
<i>Knowledge of emerging prevention</i> (1-4 ; lowest-highest knowledge)	2.90	0.78	2.48	0.79	2.05	0.68	2.64	0.73	2.91	0.77	2.61	0.85	2.49	0.79	138.54	.000
<i>Desire to learn about emerging tech</i> (1-4 ; lowest-highest desire)	3.08	0.78	3.74	0.46	3.70	0.50	3.58	0.64	2.76	0.80	3.39	0.77	2.92	0.73	193.56	.000
<i>PrEP knowledge items correct</i> (0-6 ; least-most number correct)	2.99	1.76	2.07	1.81	1.36	1.56	2.37	1.99	3.48	1.83	1.64	1.50	2.33	1.69	99.19	.000
<i>Attitudes about PrEP</i> (1-4 ; least favorable-most favorable attitude)	2.43	0.72	2.57	0.75	2.74	0.70	2.67	0.62	2.26	0.63	2.42	0.64	2.43	0.69	23.30	.000
<i>HIV prevention messages</i> (0-5 ; lowest-highest exposure)	3.97	1.31	4.09	1.32	3.34	1.70	4.23	1.30	4.09	1.20	2.45	1.99	3.27	1.41	29.67	.000
<i>HIV prevention in venues</i> (0-5 ; lowest-highest number of venues)	2.34	0.98	2.18	0.94	1.23	1.25	2.02	1.16	2.21	0.90	1.25	1.25	2.21	0.99	103.58	.000

Levels of knowledge about emerging HIV prevention strategies also differed by region, as did desire to learn more about these strategies and attitudes toward PrEP. Participants in Asia-Pacific reported the lowest levels of knowledge of emerging HIV prevention technologies, followed by participants in Central/South America and the Caribbean, Australia/New Zealand, the Middle East, and Africa. Participants in North America and Europe reported significantly higher levels of knowledge of emerging prevention than participants in all other regions. While participants in Africa, Asia-Pacific, and Central/South America and the Caribbean had less knowledge of emerging technologies than their North American and European counterparts, they demonstrated significantly higher levels of desire to learn about emerging prevention than participants from all other regions. A pattern similar to the findings on knowledge of emerging HIV prevention technologies was observed for PrEP items: participants from Asia-Pacific and the Middle East answered significantly fewer PrEP knowledge items correctly than participants from other regions. Participants in Central/South America and the Caribbean, Australia/New Zealand, and Africa responded correctly to significantly more items than participants in Asia-Pacific and the Middle East, but they answered significantly fewer PrEP knowledge items correctly relative to participants in North America and Europe, who had the highest levels of knowledge. Finally, participants from Europe had the least favorable attitudes toward PrEP compared to participants in other regions, followed by the Middle East, Australia/New Zealand, and North America.

FIGURE 1: ACCESS TO BASIC HIV PREVENTION STRATEGIES BY REGION

Note: Bars reflect average score from 18-item measure assessing access to basic HIV prevention services (measured on a 5-point Likert scale) for each region. A rating of “5” indicated high accessibility (“This is easily accessible in my community”) and a rating of “1” indicated low accessibility (“I have never heard of this”). Brackets reflect the 95% confidence interval for average scores. Average scores between regions are statistically significantly different in ANOVA ($p < 0.001$). A complete list of these basic HIV prevention services can be found in the Methods section of the Appendix.

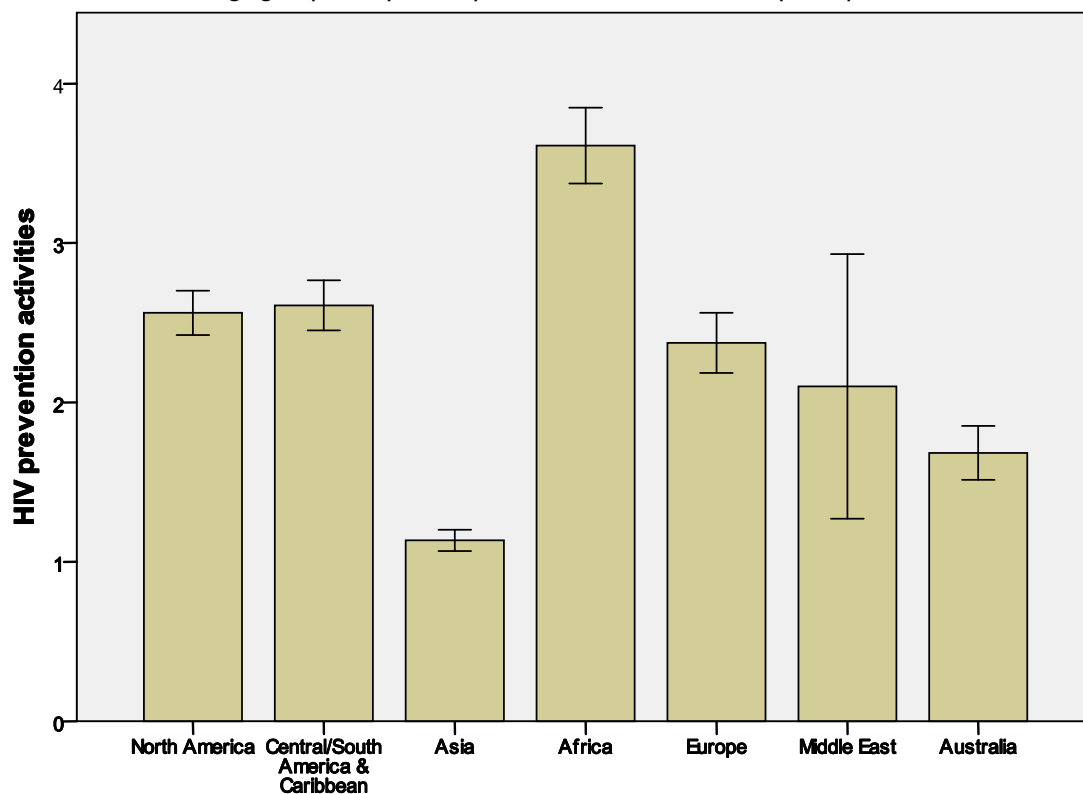
levels of access to basic HIV prevention technologies. Participants from Africa or Central/South American and the Caribbean had levels of access to basic HIV prevention strategies that were significantly lower than participants from Australia/New Zealand, Europe and North America. Participants from Asia-Pacific and the Middle East reported significantly lower access than participants from all other regions.

Additionally, there were significant regional variations in participation in HIV prevention activities. As shown in Figure 2, participants in Africa indicated having the highest level of involvement in HIV prevention activities. This was followed by participants in the Middle East, Europe, North America, and Central/South America and the Caribbean, who had roughly equal levels of participation. Participants

from Asia-Pacific and Australia/New Zealand reported the lowest levels of involvement in HIV prevention. Also, respondents in the Middle East, Australia/New Zealand, and Asia-Pacific reported significantly less exposure to prevention messages acquired in different venues relative to those in Africa, Central/South America and the Caribbean, Europe, and North America (Table I, row 9). Similarly, participants in the Asia-Pacific, Middle East and Africa reported obtaining HIV prevention materials from significantly fewer venues compared to participants from other regions (Table I, row 10).

FIGURE 2: PARTICIPATION IN HIV PREVENTION ACTIVITIES BY REGION

Note: Bars reflect average in total score from 5-item measure assessing participation in various HIV prevention activities for different age groups. Response options included “Yes, I have participated in



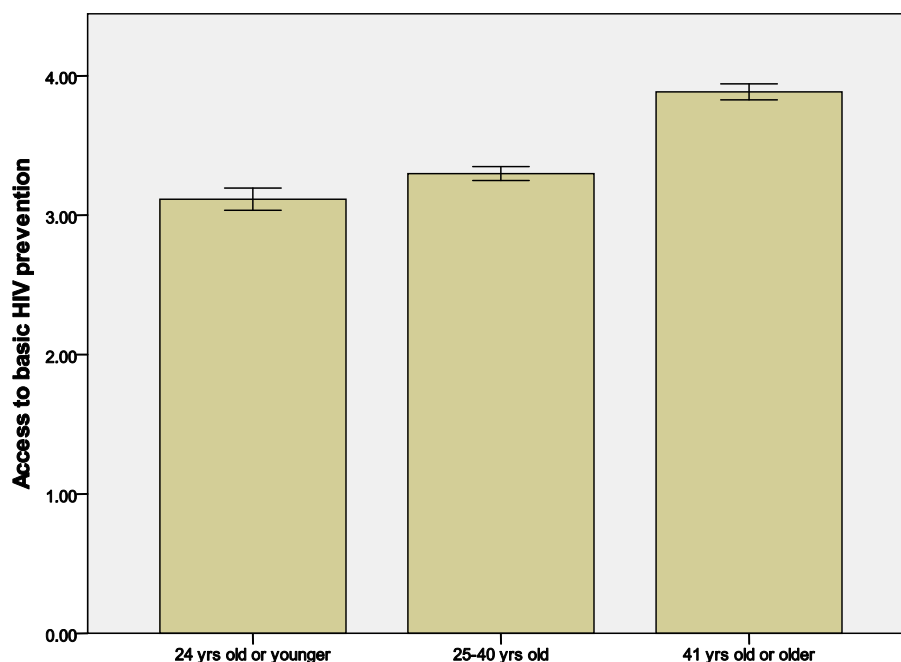
and “No, I have not participated in this.” Higher scores indicate greater participation in HIV prevention activities. Brackets reflect the 95% confidence interval for scores. Average scores between regions are statistically

AGE GROUP

As shown in Table 2, there were significant differences among age groups on each of the core study constructs. The F-values indicate where there were large differences among age groups (eg, access to basic prevention, knowledge of emerging prevention). Generally, the younger age groups appeared to be worse off in terms of psychosocial factors, access to HIV prevention (Figure 3), and engagement in HIV prevention compared to the oldest age group. For example, participants who were 41 years old or older had significantly lower perceived stigma, lower internalized homophobia, and higher self-esteem compared to participants 24 years old and younger and those 25-40 years old. The youngest participants (24 and younger) reported significantly more internalized homophobia and less self-esteem than the two older age groups. Participants who were older (41 and above) also had the highest knowledge of emerging strategies and the most number of PrEP knowledge items correct relative to the other age groups. The youngest participants (24 and younger) showed the lowest level of knowledge of emerging strategies and the fewest number of correct PrEP items. However, younger participants (40 years old and younger) reported a significantly higher level of desire to learn about emerging prevention strategies and expressed more favorable attitudes toward PrEP compared to participants 41 years of age and older.

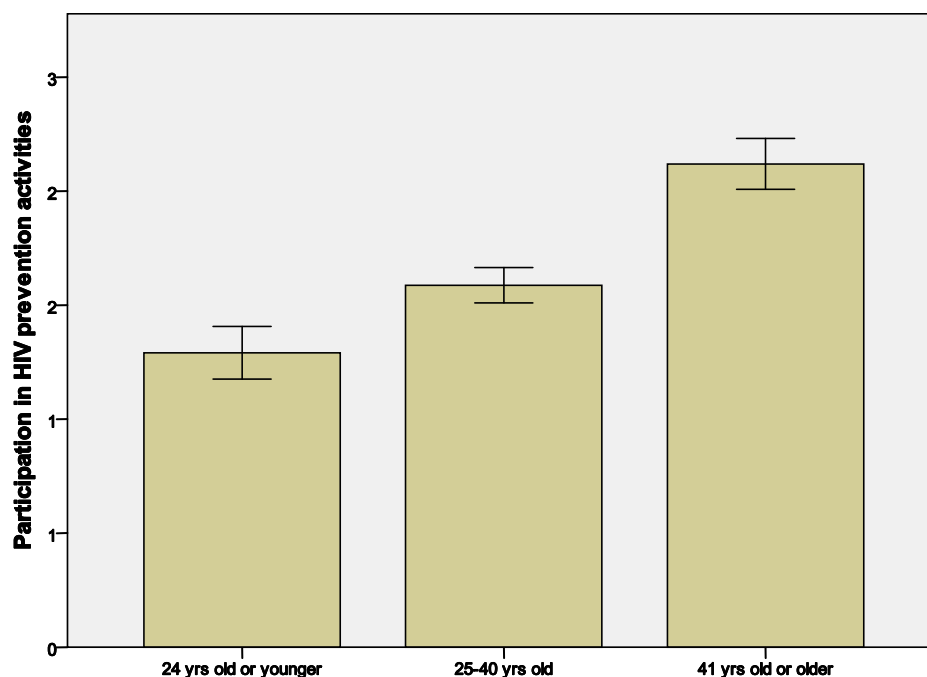
TABLE 2: COMPARISONS ON KEY CONSTRUCTS BY AGE

Construct (Range)	24 yrs or younger		25-40 yrs		41 yrs or older		F value	p
	Mean	SD	Mean	SD	Mean	SD		
<i>Perceived homophobia</i> (1-4; lowest-highest perceived homophobia)	2.50	0.73	2.47	0.76	2.27	0.76	23.24	.000
<i>Internalized homophobia</i> (1-4; lowest-highest internalized homophobia)	1.95	0.67	1.80	0.65	1.55	0.62	61.15	.000
<i>Self-esteem</i> (1-4; lowest-highest self-esteem)	3.51	0.49	3.61	0.47	3.75	0.39	49.26	.000
<i>Access to emerging prevention</i> (1-5; least-most access)	2.23	1.03	2.50	1.08	2.90	1.15	74.55	.000
<i>Knowledge of emerging prevention</i> (1-4; lowest-highest knowledge)	2.00	0.67	2.20	0.73	2.61	0.83	141.61	.000
<i>Desire to learn about emerging tech</i> (1-4; lowest-highest desire)	3.69	0.49	3.60	0.60	3.24	0.78	120.07	.000
<i>PrEP knowledge items correct</i> (0-6; least-most number correct)	1.41	1.61	1.89	1.87	2.71	1.90	85.51	.000
<i>Attitudes about PrEP</i> (1-4; least favorable-most favorable attitude)	2.70	0.71	2.63	0.71	2.51	0.72	11.51	.000
<i>HIV prevention messages</i> (0-5; lowest-highest exposure)	3.36	1.65	3.51	1.60	3.85	1.46	20.73	.000
<i>HIV prevention in venues</i> (0-5; lowest-highest number of venues)	1.32	1.28	1.60	1.24	1.97	1.14	54.91	.000

FIGURE 3: ACCESS TO BASIC HIV PREVENTION SERVICES BY AGE GROUP

Note: Bars reflect average score from 18-item measure assessing access to basic HIV prevention services (measured on a 5-point Likert scale) for each region. Brackets reflect the 95% confidence interval for average scores. Higher scores indicate greater access to basic HIV prevention services. Average scores between age groups are statistically significantly different in ANOVA ($p < 0.001$).

As shown in the figures above, participants who were 24 years old or younger indicated having significantly less access to basic and emerging HIV prevention services than the two older age groups; participants 41 years of age and older reported the most access. Finally, participants aged 24 years and younger indicated having the lowest participation in HIV prevention activities (see Figure 4, below), the lowest level of prevention messages received in different venues, and fewest venues in which they acquired HIV prevention materials, relative to participants aged 25-40 years and 41 years and older. The oldest age group (41 and older) reported the most participation in prevention activities and greatest level of access to HIV prevention messages and venues.

FIGURE 4: PARTICIPATION IN HIV PREVENTION ACTIVITIES BY AGE GROUP

Note: Bars reflect average in total score from 5-item measure assessing participation in various HIV prevention activities for different age groups. Brackets reflect the 95% confidence interval for scores. Higher scores indicate greater participation in HIV prevention activities. Average scores between age groups are statistically significantly different in ANOVA ($p < 0.001$).

MULTIPLE REGRESSION ANALYSES PREDICTING ACCESS AND PARTICIPATION TO PREVENTION SERVICES

We used multiple regression analysis to assess which demographic and knowledge, attitude and behavior (KAB) variables were independent predictors of access to basic HIV prevention services (Table 3) and participation in HIV prevention activities (Table 4). The Methods appendix describes regression model selection and model building process in detail.

The model predicting access to basic HIV prevention strategies (Table 3) included the following variables: perceived stigma/external homophobia, internalized homophobia, desire to learn about emerging prevention, PrEP knowledge, participation in HIV prevention activities, receipt of prevention messages, venues in which HIV prevention materials were obtained, HIV status, unstable/stable living situation, and age. Greater access to HIV prevention services was positively correlated with participants receiving HIV prevention messages, having access to venues that disseminate HIV prevention,

participation in HIV prevention activities, greater PrEP knowledge, being HIV-positive, having stable housing, and being older in age. Conversely, access to HIV prevention services was inversely related to MSM having greater perception of external homophobia, greater desire to learn about emerging prevention technologies. Less access to HIV prevention services was also observed among MSM who reported higher levels of internalized homophobia, though this relationship did not reach statistical significance. In our analyses, the strongest predictors of access to HIV prevention services are perceived external homophobia ($\beta = -0.29$) and number of venues in which HIV prevention materials were obtained ($\beta = 0.25$). Overall, the variables in this model explained 43% of the variance in access to prevention.

TABLE 3: DEMOGRAPHIC AND KAB VARIABLES PREDICTING ACCESS TO BASIC HIV PREVENTION

Independent Variables	Beta	S.E.	P
<i>Perceived homophobia</i>	-.29	.03	.000
<i>Internalized homophobia</i>	-.04	.03	>0.05
<i>Desire to learn about emerging prevention</i>	-.15	.03	.000
<i>PrEP knowledge</i>	.09	.01	.000
<i>Participation in HIV prevention activities</i>	.13	.01	.000
<i>HIV prevention messages</i>	.13	.01	.000
<i>HIV prevention in venues</i>	.25	.02	.000
<i>HIV-status</i>	.05	.04	.022
<i>Living situation</i>	.09	.04	.000
<i>Age</i>	-.05	.02	.019
<p><i>Note: Beta coefficients indicate increase (if beta is positive) or decrease (if beta is negative) in score for access to basic HIV prevention measure, associated with every unit increase in the predictors (ie. demographic and KAB variables). For example, a 1-point increase in a perceived homophobia score is associated with an estimated 0.29 decline in access to basic HIV prevention score. Predictors with p-values <0.05 are considered statistically significant (ie, the observed effect of the predictor is not likely due to chance).</i></p>			

Table 4 presents models predicting participation in HIV prevention. The following variables were independent predictors of participation in HIV prevention activities: perceived stigma/external homophobia, internalized homophobia, self-esteem, access to basic HIV prevention, access to emerging HIV prevention strategies, PrEP knowledge, being a provider, HIV status, and level of education. Greater participation in HIV prevention services was positively associated with MSM having greater access to basic HIV prevention, greater access to emerging HIV prevention methods, higher PrEP knowledge, being HIV-positive, greater external homophobia perception, and higher self-esteem. Being a health service provider was the strongest predictor of participation in HIV prevention services ($\beta = 0.28$), followed by access to basic prevention ($\beta = 0.23$). Together, these variables accounted for 30% of the variance in participation in prevention activities.

TABLE 4: DEMOGRAPHIC AND KAB VARIABLES PREDICTING PARTICIPATION IN HIV PREVENTION ACTIVITIES

<i>Independent Variables</i>	<i>Beta</i>	<i>S.E.</i>	<i>p</i>
<i>Perceived homophobia</i>	.15	.05	.000
<i>Internalized homophobia</i>	-.11	.06	.000
<i>Self-esteem</i>	.06	.09	.017
<i>Access to basic HIV prevention</i>	.23	.05	.000
<i>Access to emerging HIV prevention</i>	.13	.04	.000
<i>PrEP knowledge</i>	.10	.02	.000
<i>Being a health provider</i>	.28	.10	.000
<i>HIV-status</i>	.07	.08	.002
<i>Education level</i>	-.05	.04	.038
<p><i>Note: Beta coefficients indicate increase (if beta is positive) or decrease (if beta is negative) in score for the participation in HIV prevention activities measure, associated with every unit increase in the predictors (ie. demographic and KAB variables). For example, a 1-point increase in access to basic HIV prevention score is associated with a 0.23 increase in participation to HIV prevention activities score. Predictors with p-values <0.05 are considered statistically significant (ie, the observed effect of the predictor is not likely due to chance).</i></p>			

4. Conclusion and Recommendations

CONCLUSION

In this new era of the HIV pandemic, it is important that public health systems and advocates for the health of MSM have a clear understanding of just how far we have come, as well as where we have fallen short, in our efforts to reduce the impact of HIV on MSM. This moment in the HIV pandemic, also is a time for us to question: are we equipping MSM from all regions of the globe with the *proven* prevention tools needed to protect themselves and their communities? The findings from this study show that the answer to this question is unequivocally “No.”

Our study shows that access to basic, proven HIV prevention tools is not widespread for MSM and their providers worldwide. Overall, just roughly half of our participants reported easy access to HIV/STD testing and counseling and only about one third reported easy access to HIV treatment. Moreover, free condoms were easily accessible to only 44% of MSM and lubricant was easily accessible to only 29%. This coverage is neither sufficient nor acceptable. The survey also showed that there is considerable regional variation in access to basic HIV prevention strategies and participation in HIV prevention. Access to and participation in prevention strategies was lowest in the low- and middle-income regions—Asia-Pacific, the Middle East, the Caribbean and South/Central America, and Africa, while it was highest in Australia/New Zealand, North America, and Europe. This finding is consistent with other global assessments that found low penetration of basic HIV preventions interventions in low- and middle-income regions.^{1, 11, 12, 22}. Vigilant and urgent action is needed to universally scale-up the distribution of these proven prevention strategies.

Additionally, most MSM and their providers reported very limited awareness and accurate knowledge of emerging HIV prevention strategies. Correspondingly, participants indicated having apprehension and a lack of clarity around novel interventions, such as PrEP. Most participants indicated not knowing how they felt about the cost, safety, and effectiveness of PrEP. Our survey found that knowledge of PrEP and other emerging strategies was low among MSM in all regions. As expected, the highest levels of knowledge were reported by MSM in high-income regions; in North America and Western Europe, participants, on average correctly answered three out of the six PrEP knowledge questions. In contrast,

participants from Asia-Pacific and the Middle East responded correctly to the fewest number of items, averaging 1.4 and 1.6 out of 6, respectively. Interest in new strategies was highest in low- and middle-income regions outside of Australia/New Zealand, North America, and Western Europe. Importantly, though participants generally exhibited poor knowledge regarding PrEP and other emerging strategies, MSM from around the world reported a strong desire to learn more about emerging strategies overall; MSM in the study appear receptive to new approaches and are looking to learn more about how such interventions can protect their health.

The survey highlights a serious inadequacy in global efforts to provide MSM and their providers with access and information on effective and emerging tools for HIV prevention. Of note, MSM and their providers from Asia-Pacific and the Middle East have the least access to basic HIV prevention interventions, least knowledge on emerging HIV interventions, as well as the greatest interest in emerging prevention interventions, relative to MSM in other parts of the world. This finding highlights the need for large-scale efforts aimed at disseminating HIV prevention tools (including information) in the diverse countries of these regions.

Furthermore, our data shows that external homophobia continues to impact MSM negatively and to disrupt the provision of HIV prevention services to this vulnerable population. Levels of perceived external homophobia were highest in Africa, Asia-Pacific, the Caribbean, Central/South America, and the Middle East. In these regions, men were more likely to “agree” (as opposed to “disagree,” or “strongly disagree”) with statements that indicated community-level and institutional-level homophobia (eg, “Most employers will not hire a gay man/MSM”). These findings reflect the difficult realities faced by MSM to this day, many of whom live in repressive and hostile environments where consensual sexual behavior between same sex individuals is stigmatized, criminalized, and/or subject to punishment.²³ The analyses showed that perceived external homophobia independently predicts lower access to basic HIV prevention strategies. Moreover, perceived stigma/external homophobia was shown to be the construct with the greatest strength in predicting access to basic HIV prevention strategies. Our findings underscore the damaging influence of external homophobia on access to important public health services for MSM and highlight the urgent need to counter homophobia’s undermining influence. Just as importantly, however, we also found that MSM reported overall low levels of internalized homophobia; such factors that contribute to the resilience of MSM in the face of discrimination and isolation warrant greater exploration and research.

Our study also found that young MSM experience a lack of access to prevention and knowledge of emerging strategies relative to older populations. Older participants reported greater access and participation than younger participants. In our regression model, age was also a significant predictor of access to HIV prevention strategies; younger age was independently associated with decreased access. In addition, MSM under 25 years of age reported the highest levels of external homophobia and internalized homophobia in our study. It is likely these youth are experiencing harassment, rejection, violence, and social isolation—factors that may impede their access to HIV prevention. Indeed, there is a body of evidence suggesting that gay, bisexual and transgender youth who experience social discrimination are at higher risk for self-harm, and risky sexual behaviors, reflecting missed opportunities and lack of access to HIV prevention services for this vulnerable demographic group.^{24, 25} Not surprisingly, in many countries around the world, HIV incidence among young MSM is increasing, suggesting that young MSM, who may have the greatest need for prevention tools are the ones who have the least access.

The emergence of new and effective HIV prevention intervention tools is exciting and provides much needed hope for MSM who have carried a disproportionate burden of the pandemic since its inception. The ever growing range of tools to combat the spread of HIV should be viewed with cautious optimism; PrEP, microbicides and other emerging biomedical strategies are unlikely to be 100% effective alone, and basic HIV prevention interventions have been proven to be necessary, but not sufficient, in eliminating HIV. Hence these approaches need to be combined and implemented together for synergy; efficiently integrating these approaches will likely be a challenge but a task of paramount importance. In areas where access and coverage of proven HIV interventions is low or incomplete, it is crucial to accelerate the implementation of these strategies to propagate their benefits to MSM. Adequate health care penetration and optimized care for MSM are also needed—this would require breaking down the structural barriers to access, including homophobia, discrimination, stigma, and criminalization. The links between these barriers and the uptake of basic HIV prevention strategies are challenging and those seeking to prevent HIV among MSM must address these factors to truly make a significant and long-term impact.

Finally, the global response to HIV also needs to incorporate client-centered components and human-rights based principles of practice. Participation and engagement of MSM in all stages and levels of research, program and policy development, and implementation and evaluation should be prioritized. Ultimately, strategies have their biggest impact when they are guided or implemented by members of the community for which they are intended. Success is more likely when members of that community

are self-motivated and given the freedom and resources to participate in health-promoting behaviors they have worked to develop.

STRENGTHS & LIMITATIONS

There are important limitations to this survey that should be noted. First, the sample is not representative of all MSM or their health providers. Regions of the world were not equally represented in the survey. Indeed, over half (56%) of participants were from Asia-Pacific and less than 5% were from Africa (4% of the sample) or the Middle East (1% of the sample). These factors preclude the generalizability of our findings to the entire MSM population. We recognize the possibility of selection bias in this study sample of MSM who are more connected with MSM networks (eg, connection to MSMGF and its global partners); have greater access to technology and information (ie, survey is delivered via email and internet); and have motivation to respond to the survey. It is likely that our sample represents MSM who are socially connected, motivated, and linked to technology. Data from this group will likely overestimate access to HIV prevention services and knowledge of emerging interventions and underestimate levels of internalized homophobia. Thus, the reported difficulties in access to basic and emerging HIV prevention strategies are quite telling and we hypothesize that the true picture for MSM not surveyed would be more bleak. Non-response also represents another limitation strongly tied to the web-based survey method employed here. The approach does not allow us to know exactly who we are and, more importantly, who we are not reaching. More specifically, the number of people who saw the survey but did not take it is unknown, and it is unclear how similar/dissimilar these non-responders are to our sample.

Another limitation of the research is related to the reliability of constructs across languages. While most of the scales used in the survey demonstrated strong reliability, some were weaker. Notably, the self-esteem and internalized homophobia measures demonstrated poor reliability in Russian. Also, the attitudes about PrEP measure did not hold together cohesively as a scale. For example, reliability estimates were poor for the Chinese and Russian measures. Another key factor related to measurement is the use of translated measures. The translation of survey questions may have changed meanings cross-culturally. We plan to conduct additional sensitivity analyses and subgroup analyses to circumvent these limitations in subsequent follow-up analyses.

Despite these limitations, there are several strengths of the survey and methodology that should be highlighted. First, and perhaps most importantly, this survey is the first to foreground the voices of gay men and other MSM across the globe with regard to HIV prevention and attitudes about emerging HIV

prevention technologies. The work speaks to the importance of taking a rights-based approach to research, especially since stigma and homophobia play such a crucial role in limiting access to services among MSM. By focusing on the twelve key topic areas, the survey provides a comprehensive understanding of prevention services available to MSM.

Finally, though the sample was not representative, it was a large sample size composed of MSM and providers from across a diversity of regions. Over 5,000 MSM and providers from 127 countries completed the survey, permitting us to examine associations on critical variables of interest from a myriad of perspectives. The survey is the first of its type to be conducted on a global scale and across multiple languages; the data provided can inform global HIV prevention efforts and stimulate new areas of inquiry that will deepen the understanding of HIV prevention in diverse settings.

KEY RECOMMENDATIONS

There are several recommendations that can be gleaned from the findings:

1. Given the documented effectiveness of basic HIV prevention strategies, more effort needs to be expended in providing universal access to basic HIV prevention for MSM in all parts of the world. HIV prevention services that are part of the minimum HIV strategies recommended by UNAIDS and the World Bank are not currently widely accessible to MSM.
 - Robust efforts aimed at improving and expanding access to HIV prevention services for MSM should be made across the globe. Areas that remain particularly underserved (as demonstrated by survey findings) are the Middle East and Asia-Pacific, and serious challenges remain for Africa, the Caribbean and Central/South America. Greater efforts to promote access to basic HIV prevention are needed in these regions' diverse countries. Greater access to services will also foster engagement of MSM in prevention activities that can lower their risk for HIV infection or transmission.
2. Attention should be focused on promoting awareness of PrEP, rectal microbicides, and other emerging prevention interventions among MSM and their health providers.
 - The findings clearly call for targeted information campaigns about PrEP and other emerging HIV prevention strategies to ensure that MSM from all regions of the globe understand how new strategies may be used for prevention. Doing so will likely increase acceptability of these strategies and make them more feasible as public health interventions.

3. The research suggests that without robust and sustained stigma reduction efforts—particularly in Asia-Pacific, Africa, and the Middle East the Caribbean and Central/South America, where the highest levels of stigma were observed—we will fail to ensure that all MSM have the opportunity to access HIV prevention tools. Policy makers, researchers, and advocates who want to control the spread of HIV need to address stigma and discrimination as a key component of their work.
4. Finally, the survey shows that targeted efforts are needed to ensure the provision of basic prevention services to young MSM, who may be highly vulnerable to HIV. Given the rising rates of new HIV infections among young MSM, this health access disparity needs urgent attention.

The survey and findings presented here are starting points for identifying areas on which future HIV prevention outreach, advocacy, and research should focus. The survey elicited rich data from MSM living and working in varied and diverse social and political contexts. Future work could focus on regional differences and exploring the unique needs of MSM from particular countries. Likewise, key constructs shown to be related to access to prevention, such as stigma, PrEP knowledge, and age, should be further examined. Finally, further insight into the specific attitudes and perceptions of health care providers is needed. Providers such as those who participated in the survey can give a unique perspective on the HIV prevention needs of MSM, and are key stakeholders in the global effort to scale up combination approaches to HIV prevention, treatment and care services.

Appendix: Methods

The goal of the survey was to assess access to and participation in HIV prevention strategies; knowledge of and attitudes about emerging HIV prevention technologies (eg, PrEP); and perceived stigma/homophobia. Because the survey sought to assess respondents on topics for which there are few formally established measures (notably measures designed specifically for gay men/MSM), measures were adapted from existing scales and newly developed measures were created. Various procedures were implemented in the measure development and adaptation process.

First, measures assessing perceived stigma/homophobia were adapted from existing measures used with gay men in the United States. This includes a stigma scale,²⁶ internalized homophobia scale,²⁷ and the Rosenberg self-esteem scale.²⁸ Second, assessments of access to/use of prevention services, and knowledge and attitudes about PrEP were developed by drawing upon information provided by the World Health Organization, UNAIDS, World Bank and other non-governmental agencies on recommendations for minimum HIV prevention services that should be offered by health departments and communities. Specifically, several reports were reviewed in identifying prevention services and developing questionnaire items, most notably: the AIDS Vaccine Advocacy Coalition (AVAC) report, “Piecing Together the HIV Prevention Puzzle,”²⁹ and their “PrEP Fact Sheet”³⁰ the UNAIDS report, “What Countries Need: Investments Needed for 2010 Targets,”³¹ the World Health Organization’s report, “Prevention and Treatment of HIV and Other Sexually Transmitted Infections among Men Who Have Sex with Men and Transgender Populations,”³² and document entitled “Essential Prevention and Care Interventions for Adults and Adolescents Living with HIV in Resource-limited Settings,”³³ and the World Bank brief report, “HIV/AIDS At A Glance.”³⁴

Finally, the MSMGF Steering Committee vetted all questions on the survey. Committee members familiar with global health surveys provided feedback, specifically focusing on the clarity and relevance of items. Feedback provided by the Steering Committee was integrated into the final measure. Prior to its implementation, the final version of the survey was pilot tested by members of the target population (ie, MSM). The survey was also piloted for completion time; it was found to take 8-12 minutes to complete.

The survey was created in English, but translated into Spanish, French, Russian and Chinese for broader implementation of the survey globally. A professional translation service was used by the MSMGF.

After a first translated draft was developed, it underwent cultural competency and quality checks, conducted by several Spanish, French, Russian, and Chinese-speaking members of the MSMGF Steering Committee and broader network of peer volunteers. Final versions of the survey in English, Spanish, French, Russian, and Chinese are available upon request.

The survey obtained descriptive information about respondents and used in-depth measures to explore twelve key topic areas. Descriptive information collected from participants included: 1) eligibility criteria (MSM or service provider for MSM), 2) region of residence, 3) demographic information, 4) HIV status, and 5) sexual behavior. Eligibility criteria was obtained by asking participants if they would describe themselves as a “male who has sex with a male,” a “provider of health and/or social services to MSM,” a “provider and also a male who has sex with other males.” Respondents who indicated “None of the above” did not proceed with the survey. Participants who were providers (MSM or non-MSM) were asked if they “ever participated in support programs for providers of HIV prevention/treatment services” and the length of time they had been working in HIV prevention. Regional background information was collected through two questions that asked participants to indicate the general region of the world they live in (multiple choice) and indicate the country/countries in which they live (fill in the blank). Demographic information was obtained in several questions. Participants were asked their gender (response options included “Male,” “Female,” “Male-to-female transgender,” “Female-to-male transgender,” “Intersex,” and “Other”), the year in which they were born (fill in the blank), their income category (five response options from “I have no income” to “High income/upper class”), and their living situation (response options included “I have no place to live,” “I have a place to live, but it is not stable,” and “I have a stable place to live”). Participants were also asked to indicate their education level (six response options from “No formal education” to “Post-graduate/Masters/Doctoral degree”). HIV status information was assessed with the item, “What is your HIV status?” Response options included: “HIV-negative,” “HIV-positive,” and “I don’t know my HIV status” (participants were also given the option, “decline to answer”). Participants who reported being HIV-positive were asked to provide the length of the time since diagnosis and indicate whether they were taking ARVs. Finally, sexual behavior was obtained by asking participants to describe their sexual behavior using the following options: “I have not had sex with anyone in the past year,” “I have had sex with one partner in the past year,” and “I have had sex with 2 or more partners in the past year.” Participants were also asked to indicate if they engaged in sexual behaviors with men only, women only, or both men and women. Lastly, they were asked to describe their sexual identity as “Gay,” “Bisexual,” “Heterosexual,” or “Other” (fill in the blank response).

The measures representing the twelve key topic areas in the survey can be described as either scales or indices, which are both useful for measuring knowledge, attitude, and behavior (KAB) constructs. Descriptive statistics for six measures that are indices (ie, items that determine the level of a KAB construct and are aggregated into a composite score) can be found in Table 2.1; reliability estimates for the six measures that can be considered scales (ie, items whose values are thought to be *caused* by levels of an underlying KAB construct and are made into a mean score) are presented in Table 2.2.

1. **Perceived stigma/external homophobia:** This measure includes five items used to assess perceptions of homophobia in the country in which the participant lives. Items were adapted from a measure used to obtain perceptions of perceived discrimination.²⁶ An example item includes: *In the country I live in, most people believe that a person who is gay/MSM cannot be trusted.* Participant responses correspond to a 4-point Likert scale with responses ranging from “strongly agree” to “strongly disagree.” The scale demonstrates very strong reliability across different languages (0.82 – 0.90); overall internal consistency reliability was 0.86.

2. **Internalized homophobia:** This measure includes seven items used to gauge levels of internalized stigma around homosexuality/same-sex behavior among gay men. Items are adapted from a measure used by Herek and Glunt (1995)²⁷ and Meyer and colleagues (1995).³⁵ An example item includes: *I try to stop being attracted to men.* The responses correspond to a 4-point Likert scale with responses ranging from “often” to “never.” The scale demonstrates strong reliability across all the languages (0.77 – 0.85), except Russian (alpha = 0.56); overall internal consistency reliability was 0.84.

3. **Self-esteem:** This measure includes four items used to assess general feelings of self-esteem and self-worth in participants. The items were adapted from the Rosenberg self-esteem scale²⁸, which has been widely used in the U.S. and other countries to assess self-esteem. An example item includes: *I feel that I have a number of good qualities.* The responses correspond to a 4-point Likert scale with responses ranging from “often” to “never.” The scale shows good reliability in all languages (0.65 – 0.79) except Russian, which shows little/no reliability (alpha = 0.18). Across all languages internal consistency reliability was observed to be good at 0.76.

4. **Access to basic HIV prevention strategies:** This 18-item measure asks participants to rate how accessible different HIV prevention services are available in their community. Prevention services were identified by reviewing the recommendations from public health and non-

governmental agencies. Basic HIV prevention services included: HIV counseling, testing for Sexually Transmitted Infections (STIs), Treatment for Sexually Transmitted Diseases (STDs), free condoms, free water-based lubricants, needle exchange programs (NEPs), HIV medication (Antiretroviral drugs), HIV/AIDS interventions that reduce risk behaviors, mental health services, laws and policies to ensure access to HIV prevention and treatment services, free or low-cost medical care, free HIV testing, media campaigns to reduce HIV, media campaigns to reduce homophobia, sex education programs, HIV education materials, substance abuse treatment programs, and health facilities for gay men/MSM. Responses correspond to a 5-point Likert scale, where a rating of “5” indicated high accessibility (“This is easily accessible in my community”) and a rating of “1” indicated low accessibility (“I have never heard of this”). Reliability was not examined statistically, as this measure does not represent a scale.

5. **Access to emerging HIV prevention technologies:** This 6-item measure asks participants to rate how accessible emerging HIV prevention services are available in their community. Emerging strategies include “circumcision,” “post-exposure prophylaxis,” “rectal microbicides,” and “pre-exposure prophylaxis,” among others. Items are responded to using a 5-point Likert scale with responses ranging from “This is easily accessible in my community” to “I have never heard of this.” Reliability was not examined statistically, as this measure does not represent a scale.

6. **Knowledge of emerging technologies:** This measure includes 6 items that ask participants to rate how knowledgeable they feel about emerging prevention strategies including rectal microbicides and PrEP. Items were developed by reviewing reports from public health and non-governmental agencies. An example item includes: *How would you rate your knowledge of the following: microbicides to prevent transmission of HIV among gay men.* Responses correspond to a 4-point Likert scale with responses ranging from “very knowledgeable” to “not at all knowledgeable.” The scale shows strong reliability in all languages (0.76 – 0.87). Across all languages internal consistency reliability was observed to be excellent at 0.86.

7. **Desire to learn about emerging technologies:** This measure includes 6 items that ask participants to rate how much they would like to learn about emerging HIV prevention strategies such as rectal microbicides and PrEP. Items were developed by reviewing reports from public health and non-governmental agencies. An example item is: *I would like to learn more about Post-Exposure Prophylaxis (PEP) to prevent transmission of HIV among gay men.* Responses

correspond to a 4-point Likert scale with responses ranging from “strongly agree” to “strongly disagree.” The scale showed excellent reliability in all languages (0.80 – 0.92). Across all languages internal consistency reliability was found to be 0.90.

8. **PrEP knowledge:** This 6-item measure is used to assess participants’ basic knowledge about PrEP. Participants are asked to indicate whether a statement about PrEP is true or false. Participants could also endorse “I don’t know” as a response option. Items were developed by reviewing reports from public health and non-governmental agencies. An example item is: *PrEP should only be used by HIV-negative persons (True)*. Reliability was not examined statistically, as this measure does not represent a scale.

9. **Attitudes about PrEP:** This measure includes 9 items to obtain participants’ attitudes about the safety and utility of PrEP as a prevention strategy. Items for this measure were developed by reviewing reports from public health and non-governmental agencies and by using comments made in public discourse around use of PrEP with gay men. An example item is: *Please indicate how much you agree with this statement: PrEP will cost too much money*. Responses correspond to a 4-point Likert scale with responses ranging from “strongly agree” to “strongly disagree.” A fifth response option, “I don’t know,” was also available to be endorsed. The scale demonstrates acceptable reliability across languages (0.57 – 0.73), except Chinese, which showed little/no reliability ($\alpha = 0.13$). Overall internal consistency reliability was 0.60.

10. **Participation in HIV prevention activities:** This 5-item measure assesses participants’ participation in various HIV prevention activities. Participants are asked if they have participated in one-on-one counseling, support or self-help groups focused on HIV prevention, community activism, school or work-based programs focused on HIV prevention, and HIV prevention activities in faith-based organizations or places of worship. Response options include “Yes, I have participated in this,” and “No, I have not participated in this.” Reliability was not examined statistically, as this measure does not represent a scale.

11. **Exposure to HIV prevention messages:** This 5-item measure assesses whether participants have seen various HIV prevention messages. Participants are asked if they have heard radio announcement focused on HIV prevention and seen advertisements on the Internet, among other media and venues. Response options include “Yes, I have seen/heard this,” and “No, I

have not seen/heard this.” Reliability was not examined statistically, as this measure does not represent a scale.

12. **Venues in which HIV prevention materials were obtained:** This 4-item measure assesses what venues participants have received condoms or safer sex materials. Participants are asked if they have obtained condoms or safer sex materials from community organizations, nightclubs, religious institutions and other venues. Response options include “Yes, I have done this,” and “No, I have not done this.” Reliability was not examined statistically, as this measure does not represent a scale.

TABLE 2.1 DESCRIPTIVE STATISTICS FOR INDICES

Index	# of items	Min	Max	Mean (S.D.)
Access to basic HIV prevention (mean score)	18	1	5	2.51 (1.02)
Access to emerging HIV prevention (mean score)	6	1	5	3.38 (1.12)
PrEP knowledge (total score)	6	0	6	2.01 (1.83)
Participation in HIV prevention activities (total score)	5	0	5	1.72 (1.64)
Exposure to HIV prevention messages (total score)	5	0	5	3.58 (1.59)
Venues in which HIV prevention materials were obtained (total score)	4	0	4	1.66 (1.25)

Scores for each of the twelve measured were calculated for use in univariate and multivariate analyses. Numerical values were made for each response item. To create scores for scales (ie, measures 1, 2, 3, 6, 7, and 9), mean scores were obtained by getting the total score for the measure (summing all items for the measure) and dividing by the number of items. This allowed for a total scale score that used the same metric as the response options for the scale. For indices (ie, measures, 4, 5, 10, 11, and 12) scores were obtained by summing scores across items to obtain a total score. Finally, for measure # 8 (PrEP knowledge items), a total number correct score was obtained by summing the number of correct answers to each of the 6 questions.

TABLE 2.2 INTERNAL CONSISTENCY RELIABILITY ESTIMATES (ALPHA) FOR SCALES

Scale	# of items	Language	Cronbach's Alpha (α)
Perceived stigma/external homophobia	5	ALL	0.86
		English	0.85
		Spanish	0.87
		French	0.90
		Chinese	0.85
		Russian	0.82
Internalized homophobia	7	ALL	0.84
		English	0.85
		Spanish	0.81
		French	0.77
		Chinese	0.79
		Russian	0.56
Self-esteem	4	ALL	0.76
		English	0.75
		Spanish	0.65
		French	0.79
		Chinese	0.75
		Russian	0.18
Knowledge of emerging technologies	6	ALL	0.86
		English	0.87
		Spanish	0.85
		French	0.80
		Chinese	0.81
		Russian	0.76
Desire to learn about emerging technologies	6	ALL	0.90
		English	0.87
		Spanish	0.89
		French	0.89
		Chinese	0.92
		Russian	0.80
Attitudes about PrEP	9	ALL	0.60
		English	0.67
		Spanish	0.62
		French	0.73
		Chinese	0.13
		Russian	0.57

ANALYSIS

Analyses occurred in several stages. First, summary variables for the twelve key measures were created. As described previously, these summary variables were obtained by summing items of a given measure or obtaining a mean item score for the measure. Other variables were created for use in the analyses. These included creating a **region-based variable**, which used the geographic region in which participants indicated residing. Seven regional categories were used: North America, Central/South America and the Caribbean, Asia-Pacific (including South/Southeast, Central, and East Asia and the Pacific Islands), Africa (including North, Western, Eastern, and Southern Africa), Europe (including Eastern and Western Europe), the Middle East, and Australia/New Zealand. An **age group variable** was also created. This variable identified three age groups of survey participants: 1) those 24 years old or younger, 2) those 25-40 years old, and 3) those 41 years old or older.

Next, variable frequencies, correlations, and crosstabs were obtained. Variable frequencies were examined for distributions and skewness, proper coding, and missing data. Obtaining basic frequencies was also considered important from an analytic standpoint. These frequencies provide important findings that aid in describing overall access to HIV prevention services and attitudes toward emerging strategies, such as PrEP. Correlations and crosstabs (ie, Chi-square statistics) were used to determine the strength of associations among key demographic variables. Also, associations among predictors of access to and participation in HIV prevention services were explored to ensure predictors did not share too much variance (and thus would serve to confound observed relationships among predictor variables – including demographic factors and KAB constructs – and the outcome variables).

The next phase of the analysis was focused on examining group differences (ie, based on region, age) on each of the key twelve constructs measured in the survey. In order to identify group differences, and the magnitude of these differences, on key constructs, Analysis of Variance (ANOVA) and T-tests were conducted. The statistically conservative *Tukey HSD* posthoc test was used to identify significant differences between specific groups when ANOVAs were used. P-values and F-/T-values were examined to evaluate statistical significance and the magnitude of the difference between groups, respectively.

Finally, a set of multivariate analyses were conducted to examine independent predictors of access to basic HIV prevention services and participation in HIV prevention activities. Multiple regression analysis was used to test different models. Models included key demographic variables (ie, age, education, living situation, income, HIV status, and MSM vs. provider) and the KAB constructs (ie, perceived stigma, internalized homophobia, self-esteem, knowledge of emerging strategies, desire to learn about emerging

strategies, PrEP knowledge, and attitudes about PrEP) as predictors of access to basic HIV prevention services and participation in HIV prevention activities. In all regression analyses, basic “model building” was employed to obtain the most parsimonious and best-fitting regression model. This included: 1) examining all independent variables as predictors of the dependent variable (eg, access to basic HIV prevention), 2) removing variables from the model that were not statistically significant (ie, at the $p \leq .10$ level) in predicting the dependent variable, and 3) running the regression analysis again with only statistically significant variables to evaluate their independent effects. P-values and standardized betas were examined to evaluate the statistical significance and relative predictive strength, respectively, of each independent variable.

All analyses were conducted using PASW/SPSS Statistics 18. The syntax used in the analysis, along with all output provided by the statistical software program, is available on file at the MSMGF Executive Offices.

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The Global Forum on MSM & HIV (MSMGF) is an expanding network of AIDS organizations, MSM networks, and advocates committed to ensuring robust coverage of and equitable access to effective HIV prevention, care, treatment, and support services tailored to the needs of gay men and other MSM. Guided by a Steering Committee of 20 members from 18 countries situated mainly in the Global South, and with administrative and fiscal support from AIDS Project Los Angeles (APLA), the MSMGF works to promote MSM health and human rights worldwide through advocacy, information exchange, knowledge production, networking, and capacity building.

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Access to HIV Prevention Services and Attitudes about Emerging Strategies: A Global Survey of Men Who Have Sex with Men (MSM) and their Health Care Providers July 2011

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