

Men Who have Sex with Men: Racial/Ethnic Disparities in Estimated HIV/AIDS Prevalence at the State and County Level, Florida

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Abstract Population-based HIV/AIDS prevalence estimates among men who have sex with men (MSM) have been unavailable, but have implications for effective prevention efforts. Prevalent (living) Florida HIV/AIDS cases reported through 2006 (numerators) were stratified by race/ethnicity and HIV exposure category. Based on previous research, MSM populations were posited as 4–10% of all males aged ≥ 13 years in each subgroup (denominators). At the estimated lower and upper plausible bounds, respectively, HIV/AIDS prevalence per 100,000 MSM was significantly higher among black (8,292.6–20,731.4); Hispanic (5,599.5–13,998.7); and Asian/Pacific Islander, American Indian or multi-racial (4,942.6–12,356.8) MSM than among white MSM (3,444.9–8,612.3). HIV/AIDS prevalence among all MSM was 13.8–36.9 times that among all other males. Across 19 high-morbidity counties, MSM HIV/AIDS prevalence was highest among those in the most populous counties and highest among blacks. This methodology, adaptable by other states, facilitates calculation of plausible MSM HIV/AIDS prevalence to guide HIV prevention/care community planners and MSM.

Keywords Men who have sex with men · HIV/AIDS · Racial and ethnic health disparities · Statistical modeling · HIV prevention

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Introduction

Florida ranks third behind Maryland and New York among the 50 states in the rate of persons aged ≥ 13 years living with AIDS, through 2006 (Centers for Disease Control and Prevention (CDC) 2008). Men who have sex with men (MSM) bear the largest burden of AIDS and HIV cases in Florida, representing 44% (46,045) of the cumulative 105,500 AIDS cases and 41% (14,672) of the cumulative 36,127 HIV cases reported to the Florida Department of Health (FDOH) through 2006. Of 81,832 prevalent HIV/AIDS cases in Florida through 2006, i.e., persons living with HIV/AIDS (PLWHAs), 42% (34,494) were MSM.

Behaviors associated with male-male sex contact continue to contribute significantly to the reservoir and spread of HIV (Catania et al. 2001; CDC 2005; Ciesielski 2003; Jaffe et al. 2007; McFarland and Caceres 2001; Valleroy et al. 2000), yet the number of MSM has been difficult to quantify (Archibald et al. 2001; Pisani 2003). Estimates of the proportion of MSM in the male population have been developed, using a variety of scientific approaches that have led to general agreement that $<10\%$ of male populations are MSM (Binson et al. 1995; Black et al. 2000; CDC 2003a; Janus and Janus 1993; Laumann et al. 1994; Lieb et al. 2004; Lieb et al. 2007). However, we identified only 1 study that examined MSM estimates specifically by race/ethnicity (Binson et al. 1995), although that study did not do so at the state or county level. This hampers the development of a plausible set of denominators for calculation of disease rates for local community planning regarding HIV/AIDS prevention and care.

Although special serosurveys in a limited number of large American cities have reported HIV seroprevalence rates among MSM (Catania et al. 2001; CDC 2005), these studies are complex and costly to implement. This report

presents estimated population-based PLWHA rates (i.e., HIV/AIDS prevalence) among MSM by race/ethnicity at the Florida statewide and county level, derived from routine HIV/AIDS surveillance (numerator) data and population (denominator) data. To put these MSM HIV/AIDS rates in perspective, similar rates among males who are not MSM are also computed. Quantification of racial/ethnic disparities in PLWHA rates at the county level could be useful for effective planning of local primary and secondary HIV prevention approaches for the benefit of MSM. The methodology described here is inexpensive to implement and produces plausible data that are easy to calculate and comprehend. It could readily be adapted by other states and counties, enabling broad geographic comparisons of community vulnerability (Friedman et al. 2004).

Methods

The CDC HIV/AIDS surveillance classification scheme for HIV behavioral risk factors of HIV/AIDS cases encompasses risk-behaviors that have occurred since 1978 (CDC 2003b). A common convention is to analyze HIV/AIDS cases among adolescents and adults aged ≥ 13 years (CDC 2008). Accordingly, we defined MSM as all males aged ≥ 13 years who had male-male sex contact since 1978, including MSM who had a history of injection drug use. We used (1) Florida HIV/AIDS surveillance data on PLWHAs routinely collected and reported to the FDOH, stratified by county, sex, race/ethnicity and HIV exposure (risk) category, and (2) Florida population data by county, sex and race/ethnicity (FDOH midyear 2006 population estimates). PLWHAs with no identified risk factor (NIR) were redistributed into recognized risk categories based on expected results of epidemiologic investigation (Green 1998; Lieb et al. 2004). Briefly, we took the proportion of the number of historically reclassified PLWHA NIR cases in each risk group and multiplied it by the total remaining number of PLWHA NIRs. The resultant cases were added to the number of actual PLWHA cases in the risk group, thus redistributing the NIRs.

PLWHA Rates (HIV/AIDS Prevalence)

The data on MSM PLWHAs aged ≥ 13 years served as numerators for calculating PLWHA rates. The denominators (numbers of MSM) were posited to comprise 4–10% of the male populations aged ≥ 13 years. The lower limit of 4% was used based on the sole study we found that distinguished among 3 geographic areas in estimating MSM populations (Laumann et al. 1994). This oft-cited study, based on random sampling, estimated that the proportions

of the male population that are MSM are approximately 1% (rural areas), 4% (suburban areas) and 9% (large urban areas). Although the U.S. Census Bureau does not define “suburban,” “rural” is defined, and people living in rural areas of Florida comprise only 10.7% of the state’s population (U.S. Census Bureau 2002). Thus, since the state is essentially non-rural in character, we took 4% to be the overall lower limit for the state’s MSM population. In line with research previously cited, we took 10% to be the upper limit of the proportion of the male population that is MSM (Binson et al. 1995; Black et al. 2000; CDC 2003a; Janus and Janus 1993; Laumann et al. 1994; Lieb et al. 2004; Lieb et al. 2007). At the state level, we also determined PLWHA rates among all males who were not MSM (“non-MSM males”), by race/ethnicity. Since we posited that between 4% and 10% of males are MSM, then the proportions that are not MSM are between 96% and 90%, respectively. We examined the PLWHA rates among non-MSM males at the state level to present data on a comparison group for the MSM and to gain a sense of the disproportionate impact of HIV/AIDS on the MSM populations, by race/ethnicity.

We computed PLWHA rates among MSM by race/ethnicity at the county level. We limited analysis to counties having at least 15 MSM PLWHAs in each of 3 racial/ethnic groups: non-Hispanic whites (whites), non-Hispanic blacks (blacks), and Hispanics. PLWHA rates based on fewer MSM PLWHAs tended to be unstable and unreliable. At the county level, the numbers of MSM PLWHAs of other race/ethnicity (Asian/Pacific Islander, American Indian or multi-racial) were too small for inclusion.

We expressed the PLWHA rates the most conventional way as PLWHAs per 100,000 population, as well as a less conventional way, i.e., as “one-in” statements (example: “At least 1 in 22 MSM were living with HIV/AIDS through 2006”). The one-in number (22, in this example) is the inverse of the proportion of PLWHAs in the population, equaling the estimated number of persons in a given subgroup divided by the reported number of PLWHAs in the subgroup and rounded to the nearest whole number. This results in an expression of a rate that is readily comprehended, enables visualization of the absolute and relative impact of HIV/AIDS on the various subgroups, and reflects the imprecision of the MSM estimates. At the statewide level, the Katz test for statistical significance of rate ratios (RRs) was used to evaluate racial/ethnic comparisons (Kahn and Sempos 1989). The test was applied to the unrounded PLWHA rates per 100,000 population. For the counties meeting the selection criterion, we rank-ordered them from highest to lowest PLWHA rate, and compared median racial/ethnic-specific PLWHA rates among MSM, using the Mann-Whitney U test for statistical significance (Blalock 1972).

Varying the Proportion of Males That are MSM

To illustrate the relationship between the numbers of males that are MSM and the PLWHA rate among MSM, we varied the proportion of the total statewide male population aged ≥ 13 years who could be MSM from 4% to 10% in 1% increments, while holding constant the number of MSM PLWHAs in the numerator. The corresponding proportions for all other males were varied from 96% to 90%, respectively, which follows since the percentages of MSM and other males sum to 100%. We then computed the PLWHA rates among MSM and the other males.

Results

PLWHA Rates (HIV/AIDS Prevalence) Among Men, by Race/Ethnicity, Statewide

Of 56,935 reported male PLWHAs aged ≥ 13 years in Florida through 2006 (of whom 61% were MSM), 23,472 were white (71% MSM), 23,457 were black (38% MSM), 11,812 were Hispanic (69% MSM), and 1,194 were of other race/ethnicity (71% MSM). Given that 4–10% of the male populations aged ≥ 13 years were posited to be MSM, the statewide PLWHA rates were 1 in 12 (plausible upper bound) to 1 in 29 (plausible lower bound) white MSM, 1 in 5 to 1 in 12 black MSM, 1 in 7 to 1 in 18 Hispanic MSM, and 1 in 8 to 1 in 20 other MSM (Table 1). MSM PLWHA rates per 100,000 population are also shown, e.g., of all MSM, at least 4,589.8 per 100,000 population (1 in 22) were living with HIV/AIDS through 2006. Compared with white MSM, the estimated lower and upper bounds of the statewide MSM PLWHA rates were significantly higher for blacks (RR, 2.41; 95% confidence interval [CI], 2.35–2.47), Hispanics (RR, 1.63; 95% CI, 1.58–1.67), and those of other race/ethnicity (RR, 1.43; 95% CI, 1.34–1.53) (all $P < .01$, using the Katz formula for comparing rates). By contrast, the statewide PLWHA rates among males aged ≥ 13 years who were not MSM were 1 in 629 to 1 in 671 for whites, 1 in 67 to 1 in 71 for blacks, 1 in 358 to 1 in 382 for Hispanics, and 1 in 446 to 1 in 476 for those of other race/ethnicity (Table 1) ($P < .01$ for all racial/ethnic-specific comparisons of MSM PLWHA rates to non-MSM male PLWHA rates, using the Katz formula for comparing rates).

PLWHA Rates Among MSM, by County and Race/Ethnicity

Nineteen of Florida's 67 counties met the selection criterion of at least 15 MSM PLWHAs in each group of white, black and Hispanic males. The 19 counties accounted for 90.7% of all PLWHAs in the state through 2006. The

population of these counties ranged from approximately 250,000 to 2,400,000, and accounted for 77.1% of the state population. Across the counties, the median lower bounds of the MSM PLWHA rates were 1 in 51 for whites (range, 1 in 8 to 1 in 107), 1 in 15 for blacks (range, 1 in 8 to 1 in 30), and 1 in 44 for Hispanics (range, 1 in 12 to 1 in 114); the corresponding median upper bounds were 1 in 21 for whites (range, 1 in 3 to 1 in 43), 1 in 6 for blacks (range, 1 in 3 to 1 in 12), and 1 in 18 for Hispanics (range, 1 in 5 to 1 in 45) (Table 2, which shows the counties ranked from highest to lowest rate) ($P < .01$ for black/white and black/Hispanic comparisons of medians, using the Mann-Whitney test for comparing medians). Among black MSM, the PLWHA rates were not only higher, but also more tightly clustered than those among white or Hispanic MSM, reflecting a more intense and uniform impact across counties. The seven most populous counties tended to have the highest PLWHA rates among MSM of each race/ethnicity: Miami-Dade (population, 2,442,170 [FDOH midyear 2006 population estimate, unpublished data]); central city, Miami), Broward (1,755,392; Ft. Lauderdale), Palm Beach (1,290,600; West Palm Beach), Hillsborough (1,171,585; Tampa), Orange (1,087,172; Orlando), Pinellas (947,122; St. Petersburg), and Duval (883,875; Jacksonville). PLWHA rates tended to be lower in the less populous counties (population 250,000 to 800,000).

Two neighboring counties having the largest populations—Miami-Dade and Broward—had the highest PLWHA rates among white and Hispanic MSM in the state, while Miami-Dade also had the highest PLWHA rate among black MSM. These 2 counties, defined as metropolitan statistical areas (MSAs), ranked first and second, respectively, in the reported AIDS case rate among all MSAs in the U.S. with population $\geq 500,000$ in 2006 (CDC 2008). Demographically and along social and cultural dimensions, Miami-Dade County is unique in the state. Hispanics comprise 62% of the county's population, but only 19% of the state's population (FDOH midyear 2006 population estimates, unpublished data). Blacks in Miami-Dade County represent 20% of the total population, compared with 16% of the total state population. Whites represent only 16% of the county's population, compared with 63% of the state's. However, blacks are far over-represented in the county's HIV/AIDS epidemic, accounting for 49% of the 20,821 PLWHAs through 2006. Foreign-born persons predominate in Miami-Dade County, with the majority of these having been born in the Caribbean or South America. Broward County follows Miami-Dade in population size, and its racial/ethnic composition (and concomitant social/cultural diversity) also differs somewhat from that of the state: 53% white, 24% black and 20% Hispanic. Of 12,878 total PLWHAs in Broward County through 2006, 35% were white, 51% were black and 12% were Hispanic. The black

Table 1 PLWHA rates among MSM and among other males, by race/ethnicity, Florida, through 2006^a

	Midyear 2006 male population	Minimum percentage MSM (%)	Maximum percentage MSM (%)	Minimum No. MSM	Maximum No. MSM	No. MSM PLWHAs	Lower bound of MSM PLWHA rate		Upper bound of MSM PLWHA rate	
							One in...*	Per MSM*	One in...*	Per MSM*
White	4,813,443	4	10	192,538	481,344	16,582	29	3,444.9	12	8,612.3
Black	1,074,941	4	10	42,998	107,494	8,914	12	8,292.6	5	20,731.4
Hispanic	1,455,490	4	10	58,220	145,549	8,150	18	5,599.5	7	13,998.7
Other ^b	171,565	4	10	6,863	17,157	848	20	4,942.6	8	12,356.8
Total	7,515,439	4	10	300,618	751,544	34,494	22	4,589.8	9	11,474.4
	Midyear 2006 male population	Minimum percentage other males (%)	Maximum percentage other males (%)	Minimum No. other males	Maximum No. other males	No. other male PLWHAs	Lower bound of other male PLWHA rate		Upper bound of other male PLWHA rate	
							One in...**	Per 100,000 other males,**	One in...**	Per 100,000 other males,**
White	4,813,443	90	96	4,332,099	4,620,905	6,890	671	149.1	629	159.0
Black	1,074,941	90	96	967,447	1,031,943	14,543	71	1,409.3	67	1,503.2
Hispanic	1,455,490	90	96	1,309,941	1,397,270	3,662	382	262.1	358	279.6
Other ^b	171,565	90	96	154,409	164,702	346	476	210.1	446	224.1
Total	7,515,439	90	96	6,763,895	7,214,821	22,441	322	311.0	301	331.8

PLWHA, person living with HIV/AIDS (reported, prevalent HIV/AIDS case); MSM, men who have sex with men

* $P < .01$ for black, Hispanic, and other MSM, compared with white MSM (referent)

** $P < .01$ for white, black, Hispanic, and other MSM compared with the corresponding other males

^a All data in this table apply to those aged ≥ 13 years

^b Other includes Asian/Pacific Islanders, American Indians and multi-racial persons

Table 2 PLWHA rates^a among men who have sex with men, by race/ethnicity and county,^b Florida, through 2006

White MSM County	Lower bound One in...	Upper bound One in...	Black MSM County	Lower bound One in...	Upper bound One in...	Hispanic MSM County	Lower bound One in...	Upper bound One in...
Miami-Dade	8	3	Miami-Dade	8	3	Miami-Dade	12	5
Broward	11	5	Orange	8	3	Broward	16	6
Orange	13	5	Hillsborough	12	5	Orange	22	9
Hillsborough	22	9	Duval	13	5	Pinellas	27	11
Pinellas	26	10	Palm Beach	13	5	Palm Beach	29	12
Duval	30	12	Sarasota	13	5	Sarasota	30	12
Palm Beach	34	14	Pinellas	14	5	Collier	33	13
Osceola	40	16	St. Lucie	14	6	Hillsborough	33	13
Sarasota	47	19	Manatee	15	6	Osceola	43	17
Volusia	51	21	Volusia	15	6	Duval	44	18
Lee	54	22	Broward	17	7	Manatee	47	19
Manatee	54	22	Collier	18	7	Seminole	50	20
Seminole	55	22	Lake	18	7	Volusia	50	20
Brevard	61	24	Seminole	19	8	Brevard	53	21
Polk	65	26	Brevard	20	8	Lake	65	26
St. Lucie	71	29	Lee	21	8	Marion	69	28
Collier	72	29	Osceola	21	9	St. Lucie	74	30
Lake	79	32	Marion	26	10	Lee	76	31
Marion	107	43	Polk	30	12	Polk	114	45

PLWHA, person living with HIV/AIDS, aged ≥13 years (reported case)

^a Lower bounds are based on a 10% MSM population size; upper bounds are based on a 4% MSM population size

^b Includes counties (19 of 67) with at least 15 reported MSM PLWHA cases in each group, ranked from highest to lowest rate

Table 3 PLWHA rates among all MSM and other males, according to a range of their proportions in the male population, Florida, through 2006

MSM			Other males				Rate ratio*	95% CI	
Percentage MSM	PLWHA rate per 100,000 MSM	One in...	Percentage males	other	PLWHA rate per 100,000 other males	One in...		Lower	Upper
10%	4,589.8	22	90%		331.8	301	13.8	13.6	14.1
9%	5,099.7	20	91%		328.1	305	15.5	15.3	15.8
8%	5,737.2	17	92%		324.6	308	17.7	17.4	18.0
7%	6,556.8	15	93%		321.1	311	20.4	20.1	20.8
6%	7,649.6	13	94%		317.7	315	24.1	23.7	24.5
5%	9,179.5	11	95%		314.3	318	29.2	28.7	29.7
4%	11,474.4	9	96%		311.0	322	36.9	36.3	37.5

PLWHA, person living with HIV/AIDS, aged ≥13 years (reported case); MSM, men who have sex with men, aged ≥13 years

* $P < .01$ for all rate ratios

population of both these south Florida counties includes sizeable Haitian-born communities, which are also heavily impacted by HIV/AIDS.

Varying the Proportions of Males That Are or Are Not MSM

When the proportion of MSM in the total statewide male population aged ≥13 years is varied from 10% down to 4%

(in 1% increments), the rate of MSM living with HIV/AIDS varies from 4,589.8 per 100,000 population up to 11,474.4 per 100,000 population (or from 1 in 22 to 1 in 9) (Table 3). Conversely, as the proportion of other (non-MSM) males varies incrementally from 90% up to 96%, the rate of other (non-MSM) males living with HIV/AIDS decreases slightly from 331.8 per 100,000 population (1 in 301) to 311.0 per 100,000 population (1 in 322). The PLWHA rate ratios (MSM-to-other males) increase from 13.8:1 (based on the

10% MSM proportion; $P < .01$) to 36.9:1 (based on the 4% MSM proportion; $P < .01$) (using the Katz formula for comparing rates).

Discussion

Florida MSM are impacted by HIV/AIDS to a degree that is far out of proportion to their representation in the general male population. Our findings indicate that PLWHA rates are far higher among all MSM than among all males who are not MSM. The epidemic's impact is intense on virtually all racial/ethnic subgroups of MSM, more so in the most populous counties and more so among blacks. At the state level, every group of minority MSM has significantly higher PLWHA rates than white MSM. At the county level, the impact of HIV/AIDS racial/ethnic disparities on MSM is also evident, regarding black/white and black/Hispanic comparisons. MSM of all communities, with or without HIV/AIDS, would benefit from obtaining this easily grasped, compelling information, which could energize and motivate them to reduce risky behaviors, encourage HIV testing, and mobilize their communities for HIV prevention.

At the lower (and upper) bound at the statewide level, black MSM have a PLWHA rate approximately twice as high as white MSM. Similar or more extreme disparities exist in 17 of the 19 counties we studied (Table 2). These findings, based on routinely collected HIV/AIDS surveillance data and population data, support and help generalize the findings of racial/ethnic disparities in venue-based HIV serosurveys among MSM in 5 U.S. cities, where black MSM had an aggregate seroprevalence rate roughly twice that of white MSM (CDC 2005). Our findings are also supported when our PLWHA and population data for all black men aged ≥ 13 years are aggregated (black MSM plus all other black males), resulting in an HIV/AIDS prevalence rate of 2.18% (expressed as a percentage), which is comparable to the HIV seroprevalence rate among all black men aged 18–49 years (2.64%) in the most recent national household survey (McQuillan and Kruszon-Moran 2007). (The household survey data for men in other racial/ethnic groups were not published).

The findings of marked racial/ethnic disparities among MSM PLWHAs in our study have implications for focusing HIV treatment programs on disproportionately impacted populations. CDC has developed recommendations to incorporate HIV prevention into the medical care of HIV-infected persons, but without regard to age, sex, race/ethnicity or risk factor (CDC 2003c). There is also a paucity of racial/ethnic-specific HIV prevention interventions for MSM, which is particularly challenging in view of our findings. CDC's current list of approved effective behavioral interventions offers two HIV prevention

interventions designed exclusively to target MSM ("Mpowerment" and "Many Men, Many Voices"), but not by race/ethnicity (CDC 2001). The demographic, social and cultural diversity of Florida presents further challenges for targeting and implementing HIV/AIDS treatment and prevention initiatives, which is illustrated by our examination of the data for Miami-Dade and Broward counties.

Establishing plausible denominators for MSM by race/ethnicity at the state and county level is essential for estimating PLWHA rates among MSM. Researchers have conducted various surveys with different study designs to help determine overall estimates of the number of MSM (Binson et al. 1995; Catania et al. 2001; CDC 2003; Janus and Janus 1993; Laumann et al. 1994). Others have used HIV testing data (Archibald et al. 2001), census data (Black et al. 2000), a statistical components model (Holmberg 1996), and HIV/AIDS surveillance data (Lieb et al. 2004; Lieb et al. 2007) to develop MSM estimates. The definition of MSM was not consistent across these studies, as researchers tended to employ different inclusion criteria for age at time of initiation of same-sex behavior and nature/degree of same-sex behavior. A common concern of the studies was ascertainment bias, i.e., that there are men who do not self-disclose same-sex behavior due to stigma or social desirability in response to inquiries about personal risk-behaviors. Despite potential bias, the diverse methodologies of these studies have led to general agreement that the proportion of men who are MSM falls short of 10%. Thus, our use of a 10% upper limit for adolescent/adult males being MSM at the state and county levels appears robust. However, our use of 4% as the lower limit of the percentage MSM is based on one study only (Laumann et al. 1994).

There are further limitations to our data. Since there is no gold standard for establishing the number or proportion of males who are MSM in a community, overall or by race/ethnicity, more research is needed to refine such estimates in Florida and its various counties. We defined MSM as those who have had male-male sex contact since the beginning of the epidemic, and might thus capture sexual experimenters and those without ongoing risk-behavior, which could inflate the denominators and underestimate the HIV/AIDS prevalence rates. It is probable that the proportions of men that are MSM differ in the various racial/ethnic statewide and county populations. Our data do not capture this variability. The numerators of our rates could be affected due to migration of PLWHAs. A recent research study of gross in-migration to urban Florida counties found that as many as 5.2% of in-care PLWHAs could have been reported with HIV from another Florida county, and 4.2% from another state (Lieb et al. 2006). Although MSM among such PLWHAs could be missing from our county and/or statewide data, net in-migration of

PLWHAs to various counties is difficult to assess. We did not include persons with unrecognized HIV infection in our estimates. Inclusion of these persons is beyond the scope of this report, which focuses on reported HIV/AIDS cases only. CDC has provided an estimate of the proportion of all HIV-infected persons who are unaware of their infection (approximately 25%) (Glynn and Rhodes 2005), but has not provided such estimates by race/ethnicity and risk factor.

The processes of categorizing male PLWHAs by risk factor and redistributing those with no identified risk are imprecise. For all racial/ethnic groups it is probable that some MSM cases are mistakenly classified as heterosexual contact cases. This could also have resulted in underestimates of the numerators of our MSM HIV/AIDS rates. Pre-existing stigma experienced by MSM can be layered on top of HIV/AIDS stigma (Nyblade 2006), as a result of which an individual's MSM risk may be concealed. In one study, men who had sex exclusively with men but identified themselves as heterosexual were more likely than their gay-identified counterparts to belong to minority racial/ethnic groups (Pathela et al. 2006). Some research suggests that more time passes for MSM of color than for white MSM between the initiation of MSM sexual experiences and formation of sexual identity (Dube 1999). This delay is caused by inhibiting cultural influences of homophobia, discrimination, and a lack of resources. Other research indicates that identification of sexual orientation among minority MSM may be rooted in constructs of masculinity, as well as perceived norms and expectations (Mays et al. 2004). Cultural influences may cause some MSM to perceive themselves as heterosexual if they maintain the penetrating role in sexual contacts, while others fear identification as MSM despite preference for the receptive sexual role, because they associate MSM identity with emasculation (Asthana and Oostvogels 2001; González-López et al. 2006; Khan 1999; Szasz 1998; Tomas 1993). More research is needed to assess the role that MSM who are misclassified as heterosexuals play in same-sex and heterosexual transmission of HIV.

Developing plausible estimates of HIV/AIDS prevalence among MSM and other males by race/ethnicity, as we have done here, by no means obviates the need to refine these estimates and develop similar ones for women, by race/ethnicity and risk factor. Conceivably, HIV serosurveys derived from the venue-based National HIV Behavioral Surveillance project's first MSM cycle (CDC 2005) could be designed and conducted, with appropriate sampling schemes, to capture more accurate and comprehensive HIV seroprevalence trends across the state. However, large-scale studies like these would be somewhat costly and labor-intensive to develop and implement. To estimate PLWHA rates among MSM in the 48 (of 67)

counties that did not meet our inclusion criterion of 15 or more MSM PLWHAs in each racial/ethnic group, the PLWHA case data could be aggregated by region, rather than by individual county, thereby providing more robust numerators for meaningful analysis of PLWHA rates.

Public health and community HIV policy and program planners could take heed of HIV/AIDS prevalence rates among racial/ethnic groups of MSM at the state and county level for effective targeting of primary and secondary HIV prevention interventions and delivery of treatment and other support services. Selection of appropriate HIV prevention interventions should include consideration of varied cultural values, as well as comfort levels with MSM-identified prevention programs, and availability to attend interventions that may involve multiple sessions. Population-based estimates of statewide and county-specific HIV/AIDS prevalence rates among MSM by race/ethnicity could be used by public health policy makers, as well as HIV researchers and prevention/care community planners, to support new interventions, prioritization of initiatives, structural analysis of community vulnerability, development of resource allocation methodologies, social marketing, and grant writing. MSM are the primary beneficiaries of these efforts, but benefits accrue to their heterosexual and drug-using partners, as well. Racial/ethnic HIV/AIDS disparities like those we found among Florida's MSM probably apply elsewhere. The methodology described in this report could be readily and inexpensively adapted by other states to illuminate the impact of HIV/AIDS on their racial/ethnic MSM populations and to enable broad geographic comparisons.

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