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Concurrency and other sexual risk behaviors among Black young adults in a southeastern city

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Abstract

Black Americans continue to have higher rates of HIV disease than other races/ethnicities. Conventional individual-level risk behaviors do not fully account for these racial/ethnic disparities. Sexual concurrency may help explain them. Respondent-driven sampling (RDS) was used to enroll 508 sexually active 18 to 30 year old Black men and women in Durham, North Carolina in a cross-sectional survey on HIV-related topics. Consistent condom use was low for all participants, especially with steady partners. Concurrent partnerships in the past six months were relatively common for both men (38%) and women (25%). In general, men involved in concurrent relationships engaged in more risk behaviors than other men (e.g., inconsistent condom use and alcohol and drug use). A majority of concurrent partnerships involved steady partners. HIV prevention programs should address the risks of concurrency and factors that discourage condom use, especially with steady partners with whom condom use is particularly low.

Keywords

Black young adults; HIV risk; concurrency; respondent-driven sampling

Introduction

Black Americans continue to face the greatest burden from HIV/AIDS with higher rates of infection and death than other races/ethnicities (CDC, 2012a, 2012b, 2015). Furthermore, HIV continues to disproportionately impact young adults (ages 20–29) especially young Black adults (CDC, 2014).

In 2013, the rate of new HIV diagnoses for adult/adolescent non-Hispanic Blacks in North Carolina (55.8 per 100,000 population) was 8.2 times greater than that for adult/adolescent whites (6.8 per 100,000 population). Non-Hispanic Black individuals accounted for 968 (64%) of the 1,513 HIV disease cases diagnosed in NC in 2013 (NC Division of Public Health, 2014). Durham, North Carolina is a microcosm of national and state HIV-related disparities. From 2012 to 2014, Blacks (37% of the county population) accounted for 69.7% of all newly diagnosed HIV cases in the county and young adults ages 20–29 (17.1% of the county population) accounted for 42% of newly diagnosed HIV cases (NC HIV/STD Surveillance Unit, 2015). In 2013, Durham County had the 4th highest 3-year average HIV disease rate (25.7 per 100,000 population) among the state's 100 counties (NC Division of Public Health, 2014).

Individual-level risk behaviors that are associated with HIV transmission include suboptimal condom use, large number of sexual partners, the presence of other STIs, early age at first sexual intercourse and alcohol/drug use before sex (Adimora et al., 2006). These conventional individual-level risk behaviors are not sufficient to fully explain the racial disparity that exists in HIV-infection rates (Adimora & Schoenbach, 2005; Halfors, Iritani, Miller, & Bauer, 2007).

There is evidence suggesting that concurrency, or simultaneous sexual partnerships overlapping in time, may help explain increased HIV/STI rates among Blacks (Adimora, Schoenbach, & Doherty, 2006; Kretzschmar, & Morris, 1996; Morris, Kurth, Mamilton, Moody, & Wakefield, 2009; Neaigus, Jenness, Hagan, Murrill, & Wendel, 2012). At the population level concurrent sexual partnerships increase network connectivity, resulting in sexual bridging of individuals within subgroups at higher risk with those of lower-risk subgroups. Such partnerships also reduce the time between sexual contacts. Both aspects of concurrency may contribute to the spread of HIV/STIs (Adimora, Schoenbach, & Doherty, 2006; Doherty, Shiboski, Ellen, Adimora & Padian, 2006; Boily, Alary, & Baggaley, 2012). A number of social factors have been proposed as contributing to concurrency in Black communities. Most focus on lower male-to-female ratios and, consequently, on reduced numbers of available sexual/marriage partners for Black women due to high rates of unemployment, incarceration, and premature mortality among Black males (Dolwick Grieb, Davey-Rothwell, and Latkin, 2012).

Previous studies of concurrency and individual-level risk behaviors suggest that Blacks are more likely to use condoms with a “non-main” or “non-steady” partner than with a “main” or “steady” partner (Richards, Risser, Padgett, Rehman, Wolverton & Arafat, 2008; Senn, Carey, Vanable, Coury-Doniger & Urban, 2009). This may indicate that condom use, along with other HIV/STI risk behaviors, is modified by the perception of risk involved in being sexually active with a particular type of partner (Macaluso, Demand, Artz & Hook (2000); Nunn et al., 2011; Richards et al., 2008).

Consideration of concurrency raises the issue of whether HIV prevention programs should specifically address concurrency and if so, whether such programs can reduce its practice. Klichman and Grebler (2010) have argued against special interventions that focus on lowering rates of concurrency. They contend that because the role in HIV epidemics of multiple sex partners, whether concurrent or serial, is more clearly established than that of concurrency, resources should be focused on interventions aimed at reducing multiple partners. However, the work of Morris et al. (2009) supports a special focus on concurrency. They developed a stochastic network model using race-stratified data from U.S. surveys that collected information on both concurrency and assortative mixing (the tendency of people to develop partnerships with others who have a similar risk profile (Doherty et al., 2006)). The model indicated that even a small reduction in rates of concurrency among African Americans could have a profound effect on rates of HIV transmission within that population and significantly reduce Black/White disparities in HIV/AIDS. Also using a stochastic network model, Enns, Brandeau, Igeme & Bendavid (2011) came to similar conclusions about the potential impact of concurrency reduction programs on HIV incidence in sub-Saharan Africa.

There is some evidence that concurrency rates can be reduced via context-driven interventions. The “Zero Grazing” media campaign in Uganda, which addressed concurrency in a direct but culturally appropriate manner, is credited with a dramatic reduction in that nation’s HIV incidence rates (Epstein, 2007). Frye et al. (2013) conducted an HIV prevention intervention for African American men in New York City, where they observed a significant reduction in concurrency from baseline to three-month follow-up. Using a community-based participatory research approach, Andrasik et al. (2012) developed simple messages on concurrency that they then used as the focus of an HIV prevention campaign for the Black community (both African-American and African-born) in Seattle, Washington. A preliminary evaluation of the campaign (Andrasik, Clad, Bove, Tsegaselassie, & Morris, 2015) yielded positive changes in knowledge, attitudes, and behavioral intentions regarding concurrency.

LinCS 2 Durham

Linking Communities and Scientists was a 5-year community-based participatory research project in Durham, North Carolina that sought to link scientists with community members in exploring HIV prevention efforts. Details of the project have been described elsewhere (MacQueen et al., 2015). The project was guided by a Collaborative Council that included grassroots community stakeholders, potential research participants, advocates and policy-makers in allied fields, program managers for HIV and allied service areas, and researchers.

As part of this project, a survey was conducted with Black young adults to describe HIV knowledge, attitudes, and risk behaviors. The current analysis expands existing literature by: 1) identifying risk behaviors across four types of sexual partners: “steady”, “casual”, “one-night stand”, and “baby’s parent,” 2) exploring differences in risk behaviors between those in concurrent and non-concurrent partnerships, and 3) ascertaining the combinations of partners involved in concurrent partnerships.

METHODS

We conducted a cross-sectional survey informed by literature review and formative data gathered from community mapping, participant observation, and focus groups. Formative findings aided recruitment design, incentive levels, survey locations, and survey design including local terminology and the framing of questions. Throughout the design and conduct of the research activities, we solicited extensive input and feedback from the Collaborative Council. All study materials were reviewed and approved by institutional review boards at FHI 360 and North Carolina Central University (NCCU).

We sought to recruit a diverse and representative sample of sexually active Black young adults using respondent-driven sampling (RDS) (Heckathorn, 1997). In this chain referral sampling method, primary incentives were used to compensate individuals for time spent completing the survey (\$50), and secondary incentives were used to compensate individuals for successfully referring other participants to the survey (\$10 each). These incentives reduce bias toward the most cooperative participants. Participants were asked to recruit up to three of their peers using a system of coupons to track recruitment links. Recruitment quotas are set to (1) prevent overrepresentation of referrals from participants with large networks; and (2) encourage long recruitment chains to help reach a diverse group of participants less dependent on the initial recruits. (Heckathorn, 1997, 2002) Respondent-driven sampling has been used successfully in numerous HIV studies in the U.S. and elsewhere to access hard-to-reach, at-risk populations for which generating a probabilistic sampling frame would not be feasible. (Malekinejad et al., 2015; Musyoki et al., 2015; Neaigus, Jenness, Hagan, Murrill & Wendel, 2012; Rapues, Wilson, Packer, Colfax, & Fisher, 2010; Rhodes & McCoy, 2015; Tun et al., 2015; Villanti, German, Sifakis, Flynn, and Holtgrave, 2012)

Eligibility requirements included self-identifying as Black or African American; living in Durham County during the previous six months; being 18–30 years old; and reporting vaginal or anal sex in the previous six months. Women reporting sex with women only were excluded due to low HIV transmission rates in this group.

Enrolled participants were interviewed face-to-face to collect screening data and information about their social networks. Network size estimation is important for assessing homophily (a form of recruitment bias) when using RDS (Heckathorn, 2002). Participants were asked a series of questions on how many Black people they knew who were 18 to 30 years old, living in Durham county, and sexually active in the past six months. Participants then completed an audio-computer assisted survey interview (ACASI).

All data collection activities took place at community-based venues including a historically black university (NCCU), a shopping mall, a housing development, and a non-profit community health center. Enrollment began May 2011 and ended June 2012.

Measures

For this analysis we focused on sexual behaviors associated with risk of HIV acquisition. Sexual activity was explored through a series of questions beginning with the number of sexual partners a person had vaginal or anal sex with in his or her lifetime. Participants were asked how many of their partners were men to determine gender-based categories of sexual partnerships (e.g., men who have sex with men (MSM)). Participants were then asked if they had vaginal or anal sex with each of four types of partners in the previous six months: (1) a steady partner (spouse, boyfriend or girlfriend for whom they had feelings), (2) casual partners (e.g., “friends with benefits” or “booty calls”), (3) one-night stands, and (4) baby’s parent (someone with whom they had a child but were not currently in a committed relationship). Consistency of condom use with each type of partner was assessed as well as alcohol and drug use before and during sex.

Sexual concurrency was measured using the UNAIDS recommended approach, defined as overlapping sexual partnerships in which sexual intercourse with one partner occurs between two acts of intercourse with another partner (Joint United Nations Programme on HIV/AIDS, 2009). Participants were asked the first and last month of sex for each of the three most recent sex partners in the past six months. If one partnership ended and another began in the same month those partnerships were not considered concurrent. Given that some of these partnerships may have overlapped, we explored the robustness of our results by also applying a broader definition that considered as concurrent those partnerships ending and beginning in the same month.

Participants were asked about associated risks including incarceration, alcohol and drug use in the previous six months and exchanging sex for money, drugs or other resources (e.g. groceries, paying bills, transportation, and clothing).

In addition to demographic questions, participants were asked if they had ever been tested for HIV other than when donating blood. Participants were also asked eight questions regarding their knowledge of HIV (Vaccari, Poonam & Franchini, 2010; Van de Ven et al., 2002).

Statistical Analyses

We used RDS Analysis Tool (RDSAT 7.1) (Volz et. al, 2012) to estimate the population distribution of major descriptive variables in order to assess the representativeness of the sample, adjusting for biases in the chain referral sampling based on homophily and reported network size (Heckathorn, 2002; Salganik & Heckathorn, 2004).

Based on their gender and lifetime sexual partner experience, we categorized participants into five groups: men who have sex with women, men who have sex with men, men who have sex with men and women, women who have sex with men, women who have sex with

men and women. We then reviewed basic demographic criteria (education, income, age) for each group.

We compared those who were or were not in a concurrent partnership within the previous six months by demographic characteristics and HIV behavioral risk factors based on the literature and selected prior to the analysis. Finally, we explored the types of partners involved in participants' concurrent partnerships by generating separate cross tabulations by gender that identified the frequency of various combinations of partners (steady, casual, one-night stand, or baby's parent).

Differences were tested using chi-square or Fisher's exact tests for categorical variables and t-tests for continuous variables. Tests were considered significant at the .05 alpha level for two-sided comparisons.

Results

We screened 568 individuals; of these, 513 were confirmed eligible and included in the study and 508 in the analysis. Because all analyses examined differences by gender, four participants were excluded due to missing or contradictory gender responses and one person identified as transgender was also excluded.

As shown in Table 1, RDS analysis indicated that we recruited a diverse sample of the eligible Black population of Durham. Homophily was low for key selected demographic characteristics (e.g., gender, age, and education) and weighted percentages varied little from observed percentages (MacQueen et al. 2015). Additional association analyses were conducted without RDS adjustments.

Though diverse, our sample was not fully representative of the Black young adult population of Durham. Most notably, while RDS proved successful at recruiting participants in all but one 2010 Durham County census tract with more than 300 Black residents, that tract had a median household income in the top 25 % for all Black households in the county. We were also unsuccessful recruiting participants in suburban and rural census tracts outside the city limits. To compare our sample to the larger population we used data from the 2008–2012 American Community Survey 5-Year Estimates for Blacks in the city of Durham (U.S. Census, American FactFinder, 2015). As noted in the last column of Table 1, the categories for gender, age, education level, and employment status used in that survey are not precisely the same as those used in our study. Nevertheless, the comparison does suggest that our sample is slightly tilted towards males and is somewhat younger, less educated, and more likely to be unemployed than Black young adults in the city of Durham overall.

More women (273) were enrolled in our study than men (235), but the female-to-male sex ratio of 1.16, was lower than the 1.36 sex ratio for 18–29 year old African Americans in Durham. Within our sample of 18–30 year olds we had fewer older participants; 29.3% were 25–30 years old while 35.2% of Durham's 18–29 year old Blacks were 25–29. In terms of education, about the same proportion of our sample had less than a high school education as the larger population (14.0% vs. 14.8% of Durham residents 25 and older), but the proportion with just high school diplomas or GEDs was considerably higher (36.8% vs.

23.0%) as was the proportion with some higher education but less than a bachelor's degree (42.9% vs. 31.5%). The proportion with at least a bachelor's degree was substantially lower (6.3% vs. 30.7%). No doubt this difference is explained in part by the younger age of our sample (18–30) compared to the comparison group (25 or older), but perhaps not entirely since our sample was also much more likely to be unemployed than Durham Blacks age 20–24 years old (28.7% vs. 15.8%).

In terms of sexual partnering behavior, 44 (16.1%) of the 273 women recruited reported ever having had vaginal or anal sex with a woman. (All these women also reported sex with men because, as noted earlier, women who reported no vaginal or anal sex with a man in the previous six months were excluded from the study.) Among the 235 men recruited, 20 (8.5%, reported ever having had anal sex with a man, with 9 of those (3.8%), reporting same sex relationships exclusively. An analysis of the 44 women who had sex with both men and women (WSMW) and the 11 men who reported having had sex with both men and women (MSMW) indicated that these groups did not differ on basic demographic criteria (education, income, age) from women who reported only having sex with men (WSM) and men who reported only having sex with women (MSW), respectively. We therefore collapsed WSM and WSMW and also MSW and MSMW to allow for more robust sample sizes for additional analysis. We excluded the 9 men who reported only same sex relationships from further analyses. This decision reflects our concern that, on sex-related variables of interest in this study, men who exclusively partner with men may differ in substantive ways from other men. The small number of these men in our sample prevents exploration of this possibility in a meaningful way.

Sex and Risk Variables

Men reported considerably more sexual partners than women (Table 2). Women were more likely than men to report relationships with a steady partner (“a spouse or boyfriend or girlfriend you have feelings for”) in the past six months while men were more likely to report casual partners and one-night stands.

Consistent condom use was low for all participants, but men were more likely than women to report consistent use with all partners and less likely to report never using condoms. This gender difference held for each type of partner and was significant for steady and casual partners. For both men and women, consistent condom use was highest with one-night stands, lower with casual partners, and lowest with steady partners and mother or father of their baby.

Women were less likely than men to report engaging in concurrent partnerships in the last six months. They were also less likely than men to report use of alcohol or drugs before or during sex. When broken down by partner type, only alcohol and drug use differences with a steady partner were significant.

Concurrency

There were no differences in age, income, HIV knowledge or HIV testing experience between persons who did and did not report concurrency in the past six months (Table 3). Women who reported concurrency had more education than women who did not. More men

in concurrent partnerships reported a history of incarceration than other men, but the difference fell short of statistical significance.

Both men and women in concurrent partnerships reported more alcohol use than their counterparts who did not report concurrency, but the difference was only significant for women. Both men and women in concurrent partnerships were more likely than others to report episodes of binge drinking and of being unable to remember what they had done the night before on a day after drinking, but the differences were not significant. Men in concurrent partnerships were significantly more likely than other men to report use of ecstasy, marijuana, or pills.

There were no significant differences in condom use between women who did and did not report concurrent partnerships (Table 4). Men in concurrent partnerships reported less condom use than other men with all partners except one-night stands; however, these differences were not significant.

Men who had concurrent partnerships were more likely than other men to report alcohol use before or during sex with steady partners, casual partners and one-night stands. Men reporting concurrency were more likely to also report use of other drugs besides alcohol (e.g., marijuana and cocaine) before or during sex with steady partners. A difference with casual partners fell short of statistical significance.

Types of Partners Involved in Concurrent Partnerships

Our data allow us to identify the types of sexual partners participants were involved with in concurrent partnerships (Table 5). Each populated cell represents a unique combination of partners with two statistics. The first is the number of participants who reported at least one situation where concurrent partnerships involved that combination of partners. The second statistic is the total number of times that partnerships with this combination of partners were reported. For example, at the intersection of the row “Steady Partner” and the column “Casual Partner”, 33 women reported 38 instances where overlapping partnerships involved a casual partner and a steady partner. As noted in the row below, 20 women reported 29 situations where a partnership with one casual partner overlapped with a partnership with another casual partner. These two partner combinations accounted for 72.8% of all instances of concurrent partnerships reported by women. All concurrencies involving a steady partner (those with another steady partner, a casual partner, a one-night stand, or a baby’s parent) comprised 58.7% of women’s concurrent partnerships.

For men, the combination of two casual partners was about as common as the combination of a steady and casual partner. As with women, these two partner combinations accounted for a substantial majority (72.4%) of reported overlapping partnerships for men. All concurrencies involving a steady partner constituted 50.3% of men’s concurrent partnerships.

Robustness of Findings under a Broader Definition of Concurrency

Defining as concurrent those partnerships where one ended and another began in the same month increased concurrency rates from 38.2% to 46.2% for men and from 25.3% to 30.4%

for women. The direction of all associations between concurrency and other risk variables remained the same, though the strength of some associations shifted. One association with concurrency remained significant under both definitions: frequency of alcohol use in the last six months for women. Two differences in risk behavior between men who were and were not in concurrent partnerships became significant: being unable to remember activities the day after drinking and use of condoms with baby's parent; several others were no longer significant: use of ecstasy/marijuana/pills in the last 6 months; alcohol use before or during sex with steady partners, casual partners and one-night stands; and use of other drugs besides alcohol before or during sex with steady partner. For women, two differences between those who were and were not in concurrent partnerships became significant: binge drinking and use of ecstasy/marijuana/pills in the last 6 months. Beyond increasing the number of partners considered, the broader definition had little effect on our analysis of the types of sexual partners that participants were involved with in concurrent partnerships.

Discussion

In this study we successfully reached a diverse group of Black young adults in Durham, North Carolina. A comparison of demographic data from our survey with those from the U.S. census indicate that our sample was not fully representative of the Black young adult population in Durham, in that our participants were, on average, less educated and more likely to be unemployed than the larger population. Our education and employment data, as well as our inability to recruit from a higher income Black census tract, indicate that we probably recruited a sample whose socio-economic status was lower than that of the overall Black young adult population in Durham. This, in turn, suggests that participants in our study may be at higher risk for HIV disease than other Black young adults in Durham since poverty is strongly associated with HIV among inner-city heterosexuals (CDC, 2011). The high rate of lifetime incarceration for (39.6%) is consistent with this risk profile, for high incarceration rates can create conditions that foster both concurrency and HIV transmission, e.g., fewer available partners for women and interrupted relationships (Harawa and Adimora, 2008).

In our survey men and women alike reported engaging in several behaviors that place them at risk for HIV and other STIs. Gender differences emerged with men having a higher overall risk profile than women, a finding that is similar to previous research (Adimora, Schoenbach, Martinson, Donaldson, Stancil & Fullilove, 2003; Magnus et al., 2009). However, men were more likely than women to report consistent condom use with steady and casual partners.

Men were more likely than women to have engaged in concurrent partnerships in the last six months (37.2% vs. 25.3%), which has been found elsewhere (Adimora et al, 2003; Adimora, Schoenbach & Doherty, 2007; Ketschmar & Morris, 1996; Magnus et al., 2009). Despite the potential increased risk that concurrency poses, neither men nor women who engaged in concurrent partnerships reported greater use of precautions to reduce that risk. In fact, men involved in concurrent partnerships reported more risk behaviors than other men – less condom use and more alcohol and drug use before and after sex with some types of partners. These findings corroborate previous research which found risk behaviors associated with

and more likely to occur in concurrent sexual partnerships (Adimora, Schoenbach & Doherty, 2007;).

Overall, participants reported using condoms with one-night stands more than with casual partners and with casual partners more than with either steady partners or the parent of their child. This suggests that participants were making decisions on condom use based on their perceived risk of sex with different types of partners, corroborating the findings of other studies (Macaluso et al., 2000; Nunn et al., 2011; Richards et al., 2008; Senn et al., 2009).

However, concurrency complicates the picture. Concurrency increases the risk associated with multiple sexual partners, and concurrent partnerships were fairly common in this sample. Furthermore, condom use was inconsistent within concurrent partnerships. About half of all concurrencies involved steady partners, with whom condoms were least likely to be used. The other partners in these concurrent relationships were usually casual partners or one-night stands, with whom condoms were used more often but still inconsistently. Consequently, it seems likely that many persons in concurrent partnerships were bringing the risk of unprotected sex with a casual partner or one-night stand into a steady partnership where unprotected sex is clearly the norm, an issue we did not find highlighted in the literature.

To explore the robustness of our findings related to concurrency, we reanalyzed data under the assumption that partnerships beginning and ending in the same month were concurrent. As expected, the expanded definition increased concurrency rates for both men and women. Although the strength of some associations between concurrency and risk variables did change under the broader definition, the direction of associations remained the same. It's not surprising that the strength of some associations weakened because this broader definition likely included people who are not engaged in concurrent partnerships, whose risk profile may be different from those who are. It should be noted, however, that partnerships occurring very close in time increase the risk of HIV and other STI transmission even if they are not concurrent.

This study has several limitations. The cross-sectional design of the survey does not allow for causal inferences, but our descriptive analyses do not attempt to explain or predict concurrency. As noted, the sample appears to be somewhat younger, less educated, and more likely to be unemployed than the larger population of Black young adults in Durham. Therefore, survey results may have limited generalizability beyond our participants and other Black young adults like them. Since the questions we used to determine concurrency asked participants about their three most recent partners in the past 6 months, our results may underestimate concurrency regardless of the definition used. Participants who did not engage in concurrency with those partners may have had other partners with whom they had concurrent partnerships earlier in this time period. In addition, our findings may not reveal the full impact of concurrency on our participants because we collected no data on the behaviors of their partners who may or may not have been engaging in their own concurrent partnerships. This is known as indirect concurrency if an individual is not engaging in concurrency but his/her partner is (Grieb, Davey-Rothwell, & Latkin, 2012) and as reciprocal concurrency if both parties are engaging in concurrency (Neaigus et al., 2012).

Finally, the small number of men who reported sex exclusively with men prohibited any meaningful exploration of their sexual behaviors; yet this remains one of the groups at highest risk for HIV (CDC, 2012a, 2012b, 2014).

Despite these limitations, our findings suggest areas for future research and implications for public health practice. First, future research should explore whether certain combinations of partner types within concurrent partnerships are better predictors than others for HIV/STI risk behaviors and HIV/STI transmission. Second, research on concurrency should include measures of indirect and reciprocal concurrency. Finally, it should be noted that although some studies have identified factors that may contribute to concurrency – including social and economic factors (Adimora & Schoenbach, 2005), relationship dynamics (Senn, Scott-Sheldon, Seward, Wright, & Carey, 2011), and attitudes and beliefs about concurrency (Carey, Senn, Seward, and Vanable, 2010), additional research is needed on what motivates individuals to engage in concurrent relationships. This research should include the formulation and testing of a conceptual model of concurrency to explain and predict this behavior.

This study's findings may improve public health practice for HIV and STI prevention in at least two ways. First, given the low rates of condom use with main partners, practitioners should develop risk reduction strategies that address issues of trust, commitment, stigma and other factors that may diminish condom use within steady partnerships, which are often not monogamous. These strategies could include messages to encourage condom use every time with every partner (Senn et al., 2011).

Second, practitioners should consider programming that places greater emphasis on concurrency and associated risks. This programming would encourage a calculus of risk that includes concurrency, framed in language that reflects the patterning of sexual partnerships within particular populations. While it has been argued that special interventions focusing on reducing sexual concurrency should not be pursued (Klichman and Grebler, 2010), evolving evidence suggests otherwise. As noted previously this includes findings from stochastic network models (Morris et al., 2009; Enns et al., 2011) and interventions in Uganda (Epstein, 2007) and the U.S. (Frye et al., 2013; Andrasik et al., 2012, 2015). We believe our research adds to this growing body of evidence that concurrency is a common occurrence among some Black young adults and that addressing it directly could play an important role in future efforts to reduce rates of HIV transmission in this population.

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Table 1

Sample and seed distribution, RDS weighted percentages with 95% confidence intervals (CI), homophily, and comparisons to Black population in Durham for selected sociodemographic groups.

	Seed (n=12) n (%)	All Participants (n=508) n (%)	Weighted analysis Adj. % (95% CI)	Homophily H _k	2008–2012 American Community Survey 5-Year Estimates for Blacks in Durham, NC ¹
Gender					For 18–29 year olds
Male	6 (50.0)	235 (46.3)	44.7 (3.8–52.6)	0.38	8,320 (42.4)
Female	6 (50.0)	273 (53.7)	55.3 (47.9–63.2)	0.30	11,304 (57.6)
Age (years)					
18–20 years	1 (8.3)	154 (30.3)	28.7 (21.4–35.9)	0.35	18–19 yrs: 4,081 (20.8)
21–24 years	8 (66.7)	205 (40.4)	37.5 (30.8–45.0)	0.21	20–24 yrs: 8,633 (44.0)
25–30 years	3 (25.0)	149 (29.3)	33.8 (25.1–43.2)	0.22	25–29: 6,910 (35.2)
Education Level					For 25 year olds
< High school	1 (8.3)	71 (14.0)	16.4 (10.2–23.2)	0.13	8,2423 (14.8)
High school or GED	3 (25.0)	187 (36.8)	38.5 (31.2–47.0)	0.13	12,819 (23.0)
Some college, assoc. degree, or tech. certif.	4 (33.3)	218 (42.9)	38.7 (31.2–46.4)	0.26	17,568 (31.5)
Bachelor’s degree	4 (33.3)	32 (6.3)	6.4 (2.7–10.2)	0.12	17,079 (30.7)
Employment					For 20–24 year olds
Employed	5 (45.5)	222 (44.3)	42.2 (33.0–47.1)	0.22	4,651 (52.1)
Student	4 (36.4)	135 (26.9)	27.2 (20.3–33.9)	0.30	Not in labor force: 1,350 (32.1%)
Unemployed	2 (18.2)	144 (28.7)	30.6 (26.0–40.6)	0.19	1,406 (15.8)

¹U.S. Census Bureau, American FactFinder.

Table 2

Sex-Related Variables and Risk Behaviors with Types of Partner by Gender

	Male (N=226 ^f)	Female (N=273 ^f)	P-value
Total lifetime partners			<.0001
1	3 (1.3)	10 (3.7)	
2-5	45 (20.0)	91 (33.3)	
6-7	25 (11.1)	53 (19.4)	
8-10	30 (13.3)	41 (15.0)	
11-25	57 (25.3)	62 (22.7)	
More than 25	65 (28.9)	16 (5.9)	
Sex partners, by type in last 6 months²			
Spouse, boyfriend, or girlfriend	200 (88.5)	258 (94.5)	0.0150
Casual partner, one-night stand, baby's parent	179 (79.2)	157 (57.5)	<0.0001
Total partners in past 6 months			<.0001
Mean (SD)	6.0 (7.3)	3.1 (4.2)	
Median (Range)	4 (1 to 75)	2 (1 to 47)	
Number of partners in past 6 months - Steady			0.0304
Mean (SD)	1.8 (1.8)	1.5 (1.6)	
Median (Range)	1 (0 to 12)	1 (0 to 22)	
Number of partners in past 6 months - Casual			<.0001
Mean (SD)	2.9 (4.7)	1.1 (2.1)	
Median (Range)	2 (0 to 50)	1 (0 to 25)	

	Male (N=226)	Female (N=273)	P-value
Number of partners in past 9 months - One-night stand			<.0001
Mean (SD)	1.1 (2.3)	0.3 (1.3)	
Median (Range)	0 (0 to 25)	0 (0 to 19)	
Number of partners in past 6 months - Baby's parent			0.7048
Mean (SD)	0.2 (0.5)	0.2 (0.5)	
Median (Range)	0 (0 to 3)	0 (0 to 3)	
Engaged in concurrent relationship in last 6 months			0.0019
No	139 (61.8)	204 (74.7)	
Yes	86 (38.2)	69 (25.3)	
Condom use in last 6 months (with all partners)			<.0001
Consistent	65 (28.8)	46 (16.8)	
Inconsistent	142 (62.8)	162 (59.3)	
Never	19 (8.4)	65 (23.8)	
Condom Use With			
-Steady Partner			0.0008
Always	55 (27.4)	51 (19.8)	
Sometimes	116 (57.7)	131 (50.8)	
Never	30 (14.9)	76 (29.5)	
Total	201	258	
-Casual Partner			0.0188
Always	97 (56.7)	63 (45.0)	

	Male (N=226)	Female (N=273)	P-value
Sometimes			
	64 (37.4)	57 (40.7)	
Never			
	10 (5.8)	20 (14.3)	
Total			
	171	140	
-One-Night Stand			
			0.0997
Always			
	75 (75.8)	33 (61.1)	
Sometimes			
	20 (20.2)	15 (27.8)	
Never			
	4 (4.0)	6 (11.1)	
Total			
	99	54	
-Baby's Parent			
			0.3551
Always			
	9 (25.7)	7 (15.2)	
Sometimes			
	18 (51.4)	23 (50.0)	
Never			
	8 (22.9)	16 (34.8)	
Total			
	35	46	
Ever used alcohol before/during sex in last 6 months			
			0.0369
No			
	56 (24.8)	91 (33.3)	
Yes			
	170 (75.2)	182 (66.7)	
Use of Alcohol Before or During Sex With			
-Steady Partner			
			0.0357
Always			
	11 (5.5)	5 (1.9)	
Sometimes			
	138 (68.7)	166 (64.3)	

	Male (N=226)	Female (N=273)	P-value
Never	52 (25.9)	87 (33.7)	
Total	201	258	
-Casual Partner			0.1441
Always	17 (9.9)	7 (5.0)	
Sometimes	99 (57.9)	77 (55.0)	
Never	55 (32.2)	56 (40.0)	
Total	171	140	
-One-Night Stand			0.8331
Always	19 (19.2)	9 (16.7)	
Sometimes	41 (41.4)	25 (46.3)	
Never	39 (39.4)	20 (37.0)	
Total	99	54	
-Baby's Parent			0.602
Always	1 (2.9)	3 (6.4)	
Sometimes	20 (57.1)	22 (46.8)	
Never	14 (40.0)	22 (46.8)	
Total	35	47	
Ever used drugs before/during sex in last 6 months			0.0008
No	101 (44.7)	163 (59.7)	
Yes	125 (55.3)	110 (40.3)	
Use of Drugs Before or During Sex With			

	Male (N=226)	Female (N=273)	P-value
-Steady Partner			0.0266
Always	12 (6.0)	12 (4.7)	
Sometimes	92 (45.8)	89 (34.5)	
Never	97 (48.3)	157 (60.9)	
Total	201	258	
-Casual Partner			0.2176
Always	10 (5.8)	9 (6.4)	
Sometimes	84 (49.1)	55 (39.3)	
Never	77 (45.0)	76 (54.3)	
Total	171	140	
-One-Night Stand			0.916
Always	13 (13.1)	8 (14.8)	
Sometimes	36 (36.4)	18 (33.3)	
Never	50 (50.5)	28 (51.9)	
Total	99	54	
-Baby's Parent			0.0605
Always	4 (11.4)	1 (2.1)	
Sometimes	17 (48.6)	17 (36.2)	
Never	14 (40.0)	29 (61.7)	
Total	35	47	

	Male (N=226) ¹	Female (N=273) ¹	P-value
Incarcerated Ever			<.0001
No	136 (60.4)	224 (82.1)	
Yes	89 (39.6)	49 (17.9)	
Incarcerated in Last 6 Months			0.0052
No	200 (88.5)	260 (95.2)	
Yes	26 (11.5)	13 (4.8)	
Exchanged sex for drugs, money, or other in last 6 months			0.5482
No	214 (94.7)	255 (93.4)	
Yes	12 (5.3)	18 (6.6)	

¹Totals may vary due to missing data.

²Had at least one partner of this type in last 6 months.

Table 3

Demographic, HIV, and Risk Variables by Gender and Concurrency^a

	Male		Female	
	Concurrency		Concurrency	
	Yes (N=86)	No (N=139)	Yes (N=69)	No (N=204)
Age				
Mean (SD)	23.3 (3.4)	22.6 (3.4)	23.1 (3.5)	22.8 (3.4)
Median (Range)	23 (18 to 30)	21 (18 to 30)	22 (18 to 30)	22 (18 to 30)
Total	86	139	69	204
P-value	0.1259		0.4957	
Education Level				
Less than high school	10 (11.6)	19 (13.7)	2 (2.9)	39 (19.1)
High school or GED	28 (32.6)	51 (36.7)	27 (39.1)	77 (37.7)
Some college, Technical Certification, or Associates Degree	42 (48.8)	60 (43.2)	35 (50.7)	76 (37.3)
Bachelors Degree or higher	6 (7.0)	9 (6.5)	5 (7.2)	12 (5.9)
P-value	0.8429		0.0093	
Income Level				
Less than \$10,000	51 (59.3)	87 (67.4)	49 (73.1)	133 (67.9)
\$10,000 to \$14,999	14 (16.3)	14 (10.9)	7 (10.4)	32 (16.3)
\$15,000 to \$24,999	9 (10.5)	15 (11.6)	9 (13.4)	15 (7.7)
\$25,000 to \$49,999	11 (12.8)	12 (9.3)	2 (3.0)	15 (7.7)
\$50,000 or more	1 (1.2)	1 (0.8)	0 (0.0)	1 (0.5)
P-value	0.6568		0.2709	

	Male		Female	
	Concurrency		Concurrency	
	Yes (N=86)	No (N=139)	Yes (N=69)	No (N=204)
Incarcerated Ever				
No	45 (52.3)	90 (65.2)	56 (81.2)	168 (82.4)
Yes	41 (47.7)	48 (34.8)	13 (18.8)	36 (17.6)
P-Value	0.0552		0.8233	
Incarcerated in Last 6 Months				
No	75 (87.2)	124 (89.2)	67 (97.1)	193 (94.6)
Yes	11 (12.8)	15 (10.8)	2 (2.9)	11 (5.4)
P-Value	0.6485		0.5269	
HIV Knowledge				
Mean (SD)	7.1 (0.9)	6.8 (1.1)	7.4 (0.8)	7.1 (1.1)
Median (Range)	7 (4 to 8)	7 (3 to 8)	8 (4 to 8)	7 (3 to 8)
P-value	0.0628		0.1237	
Ever tested for HIV				
Yes	67 (79.8)	97 (71.3)	58 (85.3)	178 (88.6)
No	17 (20.2)	39 (28.7)	10 (14.7)	23 (11.4)
P-value	0.1627		0.4783	
Frequency of Alcohol Use in Last 6 Months				
Never	9 (10.5)	24 (17.3)	4 (5.8)	43 (21.1)
Rarely	11 (12.8)	34 (24.5)	18 (26.1)	62 (30.4)
Monthly but not weekly	34 (39.5)	43 (30.9)	33 (47.8)	66 (32.4)
Weekly but not daily	28 (32.6)	33 (23.7)	12 (17.4)	29 (14.2)

	Male		Female	
	Concurrency		Concurrency	
	Yes (N=86)	No (N=139)	Yes (N=69)	No (N=204)
About every day or more	4 (4.7)	5 (3.6)	2 (2.9)	4 (2.0)
P-value	0.0875		0.0236	
Ever Gone on Drinking Binge in Last 6 Months				
No	55 (71.4)	87 (75.7)	50 (76.9)	134 (83.2)
Yes	22 (28.6)	28 (24.3)	15 (23.1)	27 (16.8)
P-value	0.5134		0.2699	
Unable to Remember Night Before Drinking in Last 6 Months				
Never	49 (63.6)	88 (76.5)	49 (75.4)	137 (85.1)
Less than monthly	25 (32.5)	20 (17.4)	11 (16.9)	17 (10.6)
At least once a month	3 (3.9)	7 (6.1)	5 (7.7)	7 (4.3)
P-value	0.0505		0.221	
Frequency of Ecstasy/Marijuana/Pills Use in Last 6 Months				
Never	24 (27.9)	62 (44.6)	29 (42.0)	115 (56.4)
Rarely	11 (12.8)	28 (20.1)	16 (23.2)	26 (12.7)
Monthly but not weekly	7 (8.1)	8 (5.8)	5 (7.2)	14 (6.9)
Weekly but not daily	20 (23.3)	18 (12.9)	7 (10.1)	25 (12.3)
About every day or more	24 (27.9)	23 (16.5)	12 (17.4)	24 (11.8)
P-value	0.0134		0.1301	

¹Totals may vary due to missing data.

Table 4

Risk Behaviors with Types of Partners by Gender and Concurrency

	Male		Female	
	Concurrency		Concurrency	
	Yes	No	Yes	No
Consistent Condom Use With				
-Steady Partner				
No	59 (78.7)	87 (69.0)	51 (81.0)	156 (80.0)
Yes	16 (21.3)	39 (31.0)	12 (19.0)	39 (20.0)
Total	75	126	63	195
P-value	0.139		0.8689	
-Casual Partner				
No	36 (45.0)	38 (42.2)	30 (50.8)	47 (58.0)
Yes	44 (55.0)	52 (57.8)	29 (49.2)	34 (42.0)
Total	80	90	59	81
P-value	0.7154		0.3993	
-One-Night Stand				
No	9 (18.4)	15 (30.6)	6 (37.5)	15 (39.5)
Yes	40 (81.6)	34 (69.4)	10 (62.5)	23 (60.5)
Total	49	49	16	38
P-value	0.1587		0.8919	
-Baby's Parent				
No	19 (86.4)	7 (53.8)	13 (92.9)	26 (81.3)
Yes	3 (13.6)	6 (46.2)	1 (7.1)	6 (18.8)
Total	22	13	14	32
P-value	0.0505		0.4131	
Any Reported Use of Alcohol Before or During Sex With				
-Steady Partner				
No	13 (17.3)	39 (31.0)	18 (28.6)	69 (35.4)
Yes	62 (82.7)	87 (69.0)	45 (71.4)	126 (64.6)

	Male		Female	
	Concurrency		Concurrency	
	Yes	No	Yes	No
Total	75	126	63	195
P-value	0.033		0.32	
-Casual Partner				
No	18 (22.5)	36 (40.0)	26 (44.1)	30 (37.0)
Yes	62 (77.5)	54 (60.0)	33 (55.9)	51 (63.0)
Total	80	90	59	81
P-value	0.0144		0.4018	
-One-Night Stand				
No	14 (28.6)	24 (49.0)	3 (18.8)	17 (44.7)
Yes	35 (71.4)	25 (51.0)	13 (81.3)	21 (55.3)
Total	49	49	16	38
P-value	0.0382		0.071	
-Baby's Parent				
No	8 (36.4)	6 (46.2)	6 (42.9)	16 (48.5)
Yes	14 (63.6)	7 (53.8)	8 (57.1)	17 (51.5)
Total	22	13	14	33
P-value	0.5678		0.7236	
Any Reported Use of Drugs Before or During Sex With				
-Steady Partner				
No	28 (37.3)	69 (54.8)	36 (57.1)	121 (62.1)
Yes	47 (62.7)	57 (45.2)	27 (42.9)	74 (37.9)
Total	75	126	63	195
P-value	0.0168		0.4877	
-Casual Partner				
No	30 (37.5)	46 (51.1)	33 (55.9)	43 (53.1)
Yes	50 (62.5)	44 (48.9)	26 (44.1)	38 (46.9)
Total	80	90	59	81

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	Male		Female	
	Concurrency		Concurrency	
	Yes	No	Yes	No
P-value	0.0748		0.7386	
-One-Night Stand				
No	21 (42.9)	28 (57.1)	7 (43.8)	21 (55.3)
Yes	28 (57.1)	21 (42.9)	9 (56.3)	17 (44.7)
Total	49	49	16	38
P-value	0.1573		0.4394	
-Baby's Parent				
No	10 (45.5)	4 (30.8)	7 (50.0)	22 (66.7)
Yes	12 (54.5)	9 (69.2)	7 (50.0)	11 (33.3)
Total	22	13	14	33
P-value	0.3915		0.2824	

Table 5

Types of Partners Involved in Concurrent Relationships

	Steady partner	Casual partner	One-night stand	Baby's parent
Female (N=69)	# of Women [# of Concurrencies [/]]			
Steady partner	6 [6]	33 [38]	6 [6]	4 [4]
Casual partner	-	20 [29]	3 [3]	3 [3]
One-night stand	-	-	0 [0]	2 [2]
Baby's parent	-	-	-	1 [1]
Male (N=86)	# of Men [# of Concurrencies [/]]			
Steady partner	3 [3]	39 [52]	9 [10]	7 [8]
Casual partner	-	35 [53]	7 [9]	8 [9]
One-night stand	-	-	1 [1]	0 [0]
Baby's parent	-	-	-	0 [0]

[/]Number of concurrencies equals the number of instances 2 types of sexual partnerships overlapped. Data was collected on a maximum of 3 partners in the previous 6 months.