ECOLOGICAL Determinants of Multiple Sexual Partnerships among Adolescents in urban Cape Town, A Cumulative Risk Factor Analysis Approach

Theme: **1301**. Epidemiology and Demography of HIV/AIDS

Name of presenters: Evans Muchiri (Evans.Muchiri@wits.ac.za), (with Clifford Odimegwu and Sunday Adedini)

Abstract

Adolescents in South Africa are at an increased risk of HIV infection because of the context they develop in; the country has the highest HIV burden in the world, and the practice of multiple sexual partnerships is highly prevalent. This article presents findings from the Cape Area Panel Study using the innovative cumulative risk factor analysis approach. Risk factors are organized using an ecological framework into individual, household, and community levels. Using multivariate discriminant function analysis, significant risk factors are integrated to generate risk indices that investigated whether increasing risk factors correlates with increasing MSP. Results from multivariate analysis indicate that risk factors emanate from different levels of the ecology and their effect tend to be cumulative; as more risk factors become present, increasing proportion of adolescents report MSP. Interventions aimed at reducing MSP among adolescents should not only focus on individual level factors but also the household and community.

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Extended abstract

Studies in South Africa reports that adolescents and young adults are an increased risk of HIV infection because of the context they grow in; the country has the highest number of people living with HIV in the world, and multiple sexual partnerships are commonly practiced. The risk of HIV acquisition increases when multiple sexual partnerships (MSP) are existent especially when the relationships are concurrent and lasting for long durations (Fehringer et al., 2013, Watts and May, 1992, Hudson, 1993b, Hudson, 1993a). The Human Sciences Research Council report on HIV Incidence and Behaviour in South Africa reported an overall increase in the trend of people having multiple sexual partnerships between 2008 and 2012 (Shisana et al., 2009, Shisana et al., 2014).

The HSRC further indicates that unmarried people were twice as likely to report multiple sexual partnerships compared to the married(Shisana et al., 2014). This argument is relevant to adolescents in South Africa who constitute majority of the unmarried population according to Statistics South Africa statistical release reports(Stats SA, 2013). It is reported that in South Africa, age at marriage has been increasing, encouraging sexual partnerships networks that are important for new HIV transmission(Shisana et al., 2004). Researchers believe that multiple sexual partnerships together with unprotected sexual practices are major drivers of HIV epidemic in sub-Saharan African countries (Hudson, 1993b, Shisana et al., 2010, Hudson, 1993a, Zuma et al., 2010). It is reported that when number of sexual partners increase, the probability of encountering an HIV infected partner increases, depending on the HIV prevalence in the country.

Previous studies have reported determinants of risky sexual behaviours using cross-sectional datasets, but this study utilises a longitudinal data to correlate ecological risk factors and MSP. Data are obtained from the five waves of survey from the CAPS data conducted between 2002 and 2009(Lam et al., 2008). It has been reported that sexual behaviours are determined by a complex web of factors ranging from individual attitudes, genetic and biological predisposition, and household characteristic to societal factors. In this study, we report findings from integrating risk factors occurring at the e ecology, and seeking their relationship with reports of MSP among adolescents in urban Cape Town.

The data were restricted to only include adolescents that were not sexually active at baseline, and transitioned during the follow-up to report MSP in the course of follow-up. Also, adolescents that were sexually active during the baseline and transitioned to report MSP in consequent surveys were included. Our comparison group were adolescents that were not reporting MSP at any time during the follow-up, while we excluded youths that were already practising MSP at baseline.

Reporting MSP in the last year was the independent variable while risk factors were classified according to individual, household, and community levels. At the individual level, factors reported included race, school achievements and aspirations, history of sexual abuse, marital status, employment, family size, ability to make personal decisions on health, and knowledge of HIV. At the household level, risk factors included socio-economic status of the family, living with single or both

parents, parental monitoring and supervision, closeness to the parents, and parents education attainment. At the community level, mean age at marriage for men and women, socio-economic profile of the community including proportion of employed and education status of men and women. Furthermore, knowledge and attitudes towards HIV, religiosity, graduation rates, peer influence, and availability of health facilities in the community will be considered. These are risk factors that have been found to be important in some studies including additional risk factors that are hypothesised to influence early age at first sex among adolescents.

Of the 2,130 young adults reporting sexual experience at the first survey, about 29% reported multiple sexual partnerships in the last 12 months. Of the sexually active males, about 43.1% reported MSP, compared to 17% in females.

Table 1: Means and Discriminant Function Coefficient for MSP among Young Adults by Gender

	MALES			FEMALES		
Individual	No MSP	Yes MSP	P-value	No MSP	Yes MSP	P-value
Alcohol Use (1=No, 2=Yes)	1.37	1.47	<0.01	1.21	1.23	0.52
Population Group*	1.55	1.40	<0.01	1.46	1.36	0.04
Religious (1=No, 2=Yes)	1.17	1.19	0.41	1.24	1.31	0.04
Age at first sex (mean)	16.1	15.4	<0.01	16.6	16.05	<0.01
Highest Education level (mean years)	9.76	9.58	0.35	10.24	10.0	0.35
Plans to pass (1=No, 2=Yes)	1.88	1.85	0.28	1.88	1.83	0.17
Age of first sex partner (mean)	15.7	14.8	<0.01	19.8	18.7	<0.01
Age expects a first child (mean)	26.6	25.8	<0.01	25.6	25.2	0.18
Knows someone with HIV (1=No, 2=Yes)	1.15	1.23	<0.01	1.19	1.26	0.02
Knows someone died HIV (1=No, 2=Yes)	1.23	1.30	0.01	1.30	1.35	0.11
Chances of working in three years time**	3.37	3.44	0.41	3.30	3.25	0.61
Worked in the last year (1=No, 2=Yes)	1.40	1.35	0.11	1.31	1.23	0.02
Household						
Number of siblings	2.27	2.40	0.27	2.45	2.31	0.33
Parents married (1=No, 2=Yes)	1.77	1.71	0.04	1.73	1.73	0.99
Mother a HH member (1=No, 2=Yes)	1.85	1.80	0.20	1.85	1.81	0.34
Mother education (mean years)	9.4	9.0	0.52	8.4	8.5	0.86
Father education (mean years)	9.2	8.3	0.25	8.7	8.4	0.67
Father a HH member (1=No, 2=Yes)	1.64	1.65	0.80	1.67	1.65	0.48
Meals in a day in the HH (mean)	5.44	5.40	0.81	5.21	4.82	0.04
Community						
% HH Unemployed	21	24	<0.01	23	27	<0.01
% HH headed by females	40	42	0.07	41	43	0.04
%HH in Informal dwelling	24	29	0.02	28	35	<0.01
% HH Individuals Africans	54	63	<0.01	60	74	<0.01
Mean years of schooling	9.4	9.1	<0.01	9.2	9.3	0.52
% Households below Poverty Line	32	36	<0.01	35	41	<0.01

* Population group (1=black, 2=coloured, 3=white), ** a scale ranging from 1 (low) to 5 (high)

Table 6.1 reports that young adults consuming alcohol were more likely to report MSP at 37% compared to 25% reporting MSP in non-alcoholics. Young adults starting sex activities earlier were more likely to report MSP compared to their counterparts who delayed sexual activities.

6.1 Ecological determinants of multiple sexual partnerships

Many of the risk factors appeared at the individual level with five out of the six risk factors considered returning as significant. None of the risk factors considered at the household level were found to be significant, while at the community level, five out of the six risk factors assessed returned as significant. Because age of the young adult was correlated to the outcome, it was excluded from the model. Sex of the respondent was very significant implying that males and females experienced different risk factors, and analyses were therefore conducted stratified by gender.

6.2 Multi-level multivariate discriminant function analysis

A multi-level multivariate discriminant analyses were conducted adjusting for variables that were found to be important in the bivariate models. Age was also included in models including risk factors that were significant in the bivariate analysis. The means, and standardised discriminant scores are as reported on Table 2. These assessed for multivariate factors discriminating against early and late sexual debut groups of the young adolescents.

Table 2 reports on multivariate factors from discriminant function analysis, showing factors that discriminate against early age at sexual debut during follow-up. In males, significant factors at the individual level included; population group, years in education, age of first sex partner, and having worked in the last year. At the household level, parents ever married, and father spending time in the household were mildly important but had no significant effect on early sexual debut. Community factors included employment levels, female headed households, informal dwellings in the community, poverty levels, and proportion of families classified as black Africans.

Table 2: Multivariate means and standardized discriminant function coefficient for early sexual debut in follow-up

	MALES				FEMALES			
Independent Variables	Late Sexual Debut	Early Sexual Debut	F-Value	P-value	Late Sexual Debut	Early Sexual Debut	F-Value	P-value
Individual								
Population group (1=Black, 2=Others)	1.67(0.47)	1.30(0.46)	28.17	<0.01	1.59(0.49)	1.32(0.47)	8.31	<0.01
Years of Education (mean years, SD)	8.62 (2.45)	7.66 (2.00)	7.51	<0.01	9.12 (2.30)	7.78 (1.76)	6.15	<0.01
Currently in school (1=Yes, 2=No)	1.19 (0.40)	1.22 (0.41)	2.00	0.14	1.17(0.38)	1.13 (0.34)	4.22	0.02
Plans to pass Matric one time (1=Yes, 2=No)	1.08 (0.28)	1.08(0.27)	0.06	0.93	1.06 (0.23)	1.03 (0.17)	1.52	0.22
Age of first sex partner	17.0 (2.73)	13.4 (2.37)	63.54	<0.01	20.81 (3.75)	17.73 (3.31)	11.14	<0.01
Worked in the last 12 months (1=Yes, 2=No)	1.73 (0.44)	1.91 (0.28)	7.48	<0.01	1.82 (0.38)	1.97 (0.16)	5.11	<0.01
Religious (1=yes, 2=No)	1.69 (0.46)	1.78 (0.41)	2.61	0.07	1.63 (0.48)	1.69 (0.46)	3.75	0.41
Household								
Number of siblings (Mean, SD)	2.04 (1.5)	2.20 (1.7)	1.67	0.19	2.14 (1.6)	2.48 (2.0)	4.62	0.01
Parents married (1=Yes, 2=No)	1.21 (0.4)	1.29 (0.5)	2.44	0.08	1.26(0.4)	1.35 (0.4)	4.40	0.01
Mother often spend time with young adult	5.10 (2.2)	4.86 (2.2)	1.24	0.29	5.19(2.1)	5.88 (1.6)	6.10	<0.01
Father often spends time with young adult	3.96(2.4)	3.45 (2.6)	2.61	0.07	3.64(2.5)	3.6(2.5)	2.39	0.09
Brother or sister helps with homework	1.83 (0.3)	1.77 (0.4)	2.04	0.13	1.81(0.4)	1.81(0.4)	3.88	0.02
Meals in a day in the household (Mean, SD)	3.81 (0.5)	3.83 (0.5)	0.77	0.45	3.81(0.4)	3.83(0.4)	3.86	0.02
Most influence on future job (Mean, SD)	2.29 (2.6)	2.43(2.5)	1.14	0.32	2.32(2.5)	1.89(2.0)	4.44	0.01
Community								
% HH Unemployed (Mean)	0.16(0.1)	0.25(0.1)	44.8	<0.01	0.18(0.1)	0.23(0.1)	6.13	0.01
% HH headed by females (Mean)	0.39(0.1)	0.42(0.1)	8.08	<0.01	0.40(0.1)	0.41(0.1)	0.07	0.77
%HH in Informal dwelling (Mean)	0.13(0.2)	0.27(0.3)	24.24	<0.01	0.16(0.3)	0.26(0.3)	4.38	0.04
% HH Individuals Africans (Mean)	0.34(0.4)	0.71(0.4)	60.96	<0.01	0.41(0.5)	0.68(0.5)	12.05	<0.01
% HH below Poverty Line (Mean)	0.25(0.2)	0.38(0.1)	52.75	<0.01	0.27(0.2)	0.35(0.2)	7.74	0.01

Results from the discriminant function analyses demonstrate a number of significant risk factors that are important determinants of multiple sexual partnerships among young adults. These risk factors were obtained separately for males and females and appear to occur at the individual, household, and community levels. A cumulative risk index was developed first by scoring all significant factors (either as 0 when risk was absent and 1 when risk was present using meaningful cut-off points) and summing present risk factors.

Results indicate that males had more risk factors present compared to females in the first wave of the survey as appearing on Figure 1. Males had a maximum of thirteen risk factors present compared to females with a maximum of ten risk factors. For males, the most common risk factor is the community schooling levels while for females religious affiliation was common. Males coming from communities with a higher level of schooling significantly reported reduced number of MSP while females practicing religion had significantly reduced number of MSP. Table 1 shows a number of risk factors that significantly discriminated against MSP among the young adults.

6.3 Cumulative risk factor analysis

All significant factors were used in the construction of a cumulative risk index. Risk factors were scored as either 0 (if risk was absent) or 1 (if risk was present) using meaningful cut-off points considered for the risk. Cumulative risk indices were generated by summing the scores generated from the risk factors identified for each of the young adult. Proportions reporting early sexual debut at follow-up were plotted against the cumulative risk indices.

Figure 1: Percentage reporting multiple sexual partnerships against significant risk factors

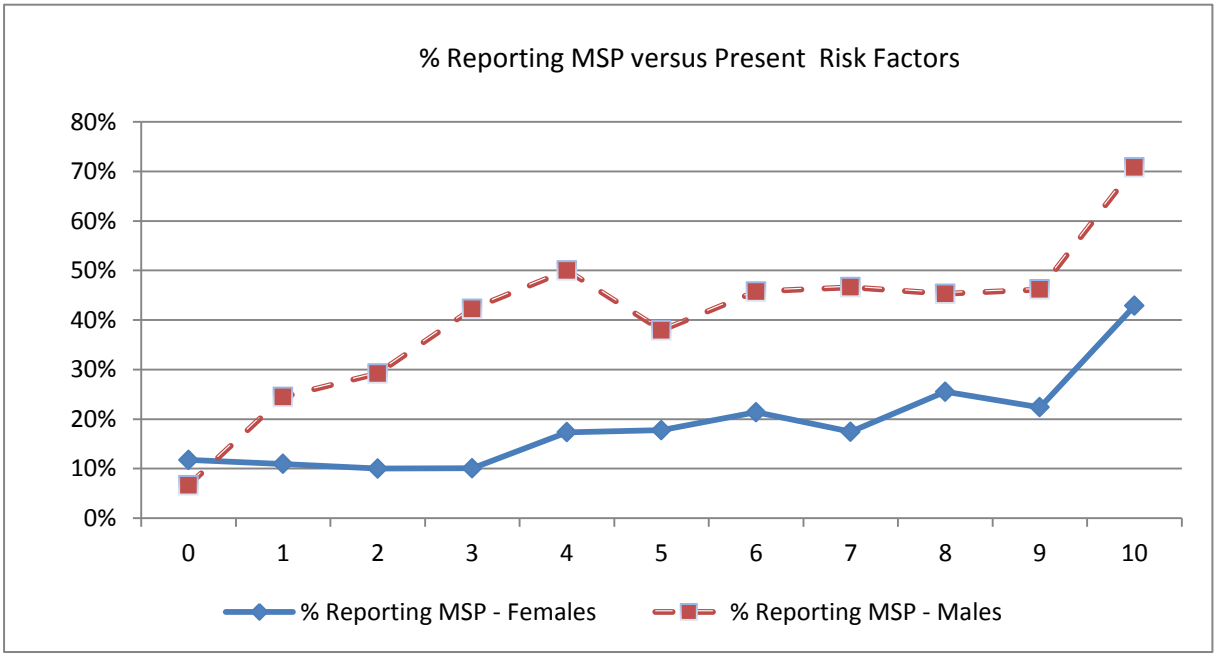

Figure 1 shows that the more risk factors present in a young adult's life, the higher the proportion reporting multiple sexual partnerships implying that risk factors act cumulatively to determine sexual risky behaviours. These findings are important for South Africa and other countries facing a high HIV prevalence among young adults. To change adolescent sexual behaviours and reverse the HIV trend, interventions should be aimed at multiple levels of the ecology as risk factors occur at the various levels, and act cumulatively to influence sexual behaviours.

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