Place of Residence and Sexual Behavior: Evolving norms?

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Abstract

This paper examines the relationship between past place of residence (urban/rural) and current sexual behavior of urban Malawian men. Data from approximately 1300 men aged 18 to 40 are used in the analysis. Men raised predominantly in rural areas, initiate sex later (approximately 1 year later than those raised predominantly in urban areas), but experience higher fertility (2.7 children compared to 2.1). The relationship between sexual behavior practices and the cumulative amount of time lived in an urban area shows that the longer an individual resides in an urban area the more frequently he will use a condom during sex (the fraction of safe sex encounters increases). These results are more pronounced among unmarried men. This suggests that unmarried migrant men adjust their sexual behavior over time but it is a relatively slow adjustment. In a context with high HIV rates (higher in urban areas) and a high urbanization rate it suggests that HIV prevention policies should be targeted to such groups to accelerate this condom adoption process.

1. Introduction

It is well recognized that rapid migration is a significant phenomenon in developing countries. Malawi is a particularly interesting in terms of the rapid internal migration as it has the fourth highest urbanization rate in Africa – with a rate of 5.22% (HDR, 2009). Also, the prevalence of HIV is also high (approximately 10.6% for men) and it is differential across urban and rural regions – in particular HIV rates are lower in rural areas (approximately 7% for men) compared 12 % in urban areas for men (DHS 2010). Understanding the relationship between migration and sexual behavior in the context of HIV is therefore of interest. This paper aims at examining the differences in sexual behavior and attitudes among urban men by place of residence during childhood and adolescence (rural or urban). Moreover, this paper examines the relationship the amount of time spent in the urban center and sexual behavior.

It is widely accepted than rural and urban areas are substantively different. Many theories attempt to explain the differences between rural and urban areas. Many of these theories have also tried to understand how these differences affect various aspect of development that is including human development. Attempts have also been made to examine the opposite that is how rural and urban settings lead to various differentials. This paper uses "the life course as a developmental theory", (Elders 1998), as a basis of its research question. His principle of historical time and place; timing in life: linked lives and human agency (Elders 1998, p3-p4.), to explain how rural and urban lives differ. Moreover, this theory attempts to explain how living in different types of settings at different times would impact ones later life outcomes. Existing mechanisms such as family structure, societal structure, nature of friendship networks and levels of economic development are well placed to support this theory. Urban settings characterized by predominantly nuclear families; relatively less conservative culturally; where it is common place to have relations with strangers; and economically relatively much more developed such that access to information and services is much higher all interact in determining an individuals' health. This is comparatively different to rural areas where consanguineous families are more popular; culturally much conservative, relations are mostly with relatives or acquaintances, economically relatively underdeveloped such that access to information and services are very limited. It is not difficult to believe that individuals living in these different environments exhibit

different health behaviors. Relocating between these two environments is likely to lead to even more interesting health behaviors changes.

In this particular paper I examine urban men. I examine their past place of residence at different stages of their life (child hood; adolescence) and its bearing on later life sexual behavior. I also examine the relationship between the cumulative amount of time spent in urban areas and men's current sexual behavior.

I find that men who spent childhood and adolescent lives in rural areas initiate sex earlier, and they bear more children than men who spent childhood lives in urban areas. Interestingly, other than these two results there are not striking differences in terms of their sexual behavior on average. That is it appears that they are exhibiting similar sexual behavior practices.. Their health attitudes and beliefs are different, but the differences are not statically different.

However, looking at these averages obscure important differences in sexual behavior. By looking at the relationship between duration of stay in urban area and different sexual behavior practices we observe large and important differences. Staying longer in urban areas lead to high rates of condom use, decreased sexual frequency, prolonged abstinence for those that have never had sex, and declining abstinence for those that have ever had sex. It appears that new migrants increase their safe sex practices over time (for eg. increasing condom use). However, given the stark differences in HIV prevalence between urban and rural areas, they are not compensating for their increased risk.

This paper is organized in the following way. Section 2 discusses some of the existing literature. Section 3 presents details about the data used including a description of the demographics of the sample. Section 4 presents the methodological approach, while Section 5 discusses the results. Section 6 concludes.

2. Background and Existing Literature

There exists an extensive literature that examines the the relationship between migration and health. A recent study has found that international migration lead to rise in blood pressure for migrants as well as increase in stress levels (Gibson et. Al, 2010).Studies in Kenya found that rural to urban migration lead to increased incidence of systolic blood pressure (Poulter et. al.

1990). In India migration was found to be associated with increase in fat intake and less physical activities, which consequently lead to diabetes and obesity in both migrant men and women. (Ebrahim et.al. 2010)

There is also an extensive literature that has looked at the relationship between migration and sexual health behaviors. Studies in Malawi found that men who were HIV positive were more likely to migrate from rural areas than men who were not (Anglewicz, 2006). In rural Uganda, a study examining the relationship between change of residence and HIV-1 serostatus found that, change of residence was strongly associated with an increased risk of HIV-1 infection. They report that similar to the Anglewicz (2006) study that it is the men who engage in riskier sexual behaviors are those who are more likely to relocate (Nunn et. al 1995). A meta-analysis (using 29 sub-Saharan African countries) found a strong positive association between in-migration and HIV prevalence (Vissers et. al. 2010). The association was very strong for women than men. However, the study did not establish causation. That is, whether changing of residence precedes contacting the virus or the other the round.

There also exist a number of studies that have analyzed other factors that might explain sexual behaviors of migrants in an indirect way. The societal structure of the rural areas tends to restrict sexual activity and those of town encourage more sexual behavior. Anarfi (1993) posited that Ghanaian extended family system tends to restrict peoples sexual partners in small localities. On the other hand a town offers some people a wide variety of options in terms of sexual partners as they are mostly strangers (Anarfi 1993). However this can be applied to most African countries especially in rural areas where most people are related and in urban areas there is a mix of strangers. Studies in Cameroon found that youth living in extended families, and marginally those who lived with other relatives, are far more likely to engage in premarital intercourse at an earlier age (Dimbuene and Defo 2011). Similar studies found the same results when they find that adolescents looked after by siblings (and not parents were, more likely to initiate early sex than adolescents looked after by parents (Fako, 2010). In a separate study in Ghana that examined the process of migration, they found that when searching for jobs, men move to town and stay with their next of kin's or distant relatives before they establish themselves and find their own place. In both internal and international migration relatives and friends play a major role in the settlement of migrants (Anarfi 1993).

Many studies on place of residence and health behaviors have focused on causal relationships between migration and sexual behaviors. They have compared migrants and individuals at point of destination only, or comparing individuals before migrating and after migrating to those that never migrated.

This study brings in a different dimension to the already exist literature on migration studies as well as rural-urban studies. It looks at retrospective self reported history of where one spent his life during two vital stages of human development namely, childhood and adolescent . In part we are trying to understand relationship between early life experiences and their contribution to later sexual behavior. This is under the assumptions that during these stages of life development men tend to develop sexually and form an idea of their own preferred sexual life. The social environment also contributes to the development of the sexual behavior practices.

A key contribution of this paper is that it not only examines the differences in sexual behavior but also exploits variation in the amount of time lived in an urban area to examine how sexual behavior evolves over time spent in urban areas. Previous studies have only showed changed caused by moving from point A to point B, but not many have examined the effect of length of stay on individuals' health behaviors especially sexual behaviors.

3. *Data*

Sample

This paper uses data from the Circumcision, Information and HIV Prevention Study conducted in urban Lilongwe in Malawi. Approximately 1700 uncircumcised men were interviewed during a baseline survey conducted in early 2010 and 1300 men were revisited approximately 12 months later. Men were sampled from 29 enumeration areas that were selected randomly. The enumeration areas (EA's) were defined by the National Statistical Office (NSO) and are a defined unit used by NSO for the population census conducted in 2008. The study divided each individual enumeration area, into smaller sampling units which will be referred to as blocks. Blocks were defined using EA boundaries as well as road and river networks that run through enumeration areas. There are 114 blocks across the 29 EAs – 60 of these were selected (covering all EA's) and a full household census was conducted in each selected block. Men aged between 18 and 40 who were permanent resident of the households within selected blocks were

eligible for the study. Only one man per household was eligible to participate in the study. When more than one eligible person existed in a household, a respondent was randomly selected between them.

Data and definitions

During the baseline study, conducted in 2010, respondents were asked about demographics such as age, marital status, number of education years, religious denomination, ethnicity, as well as respondent's perception of their own financial situation. An extensive sexual behavior and attitudes module was included in this survey covering - sexual debut, number of children ever given birth to, and life time numbers of sexual partners as well as more recent sexual behavior indicators – current condom use and sexual activity.

During the follow study, approximately 12 months after baseline, respondents were re-asked most sexual behavior and attitudes questions as well as a module on their place of residence over their lifetime. Men were asked where they resided at different stages of their lives (urban, peri-urban and rural) during childhood and adolescence as well as the cumulative number of years they had resided in Lilongwe (urban area). Specifically men were asked, "Where did you spent most of your childhood. In an urban area, peri-urban area, or rural area?". They were also asked: "Where did you spend most of your adolescence (ages 10 to 15). In an urban area, peri-urban area, or rural area?". Lastly, they were also asked how many years total had they lived in Lilongwe (the capital city of Malawi) in total – that is if they had moved back and forth between Lilongwe and other areas it was meant to include all time spent in the Capital. This is likely to underestimate the amount of total time spent in urban areas.

It is also important to note that in this case a peri–urban area is defined as a rural area evolving to become an urban area – often with an active and growing trading center. It therefore resembles partially rural areas and partially urban areas. Given the relative small sample size of these individuals they are not discussed in this version of the paper, but the results are presented for completeness.

Table 1 presents summary statistics regarding the sample used in the analysis. Examining demographic composition of the sample is very important especially in this study as characteristics such as age, level of education, level of wealth; marital status and others do have

influence on sexual behaviors of men as it may have implications on health outcomes such as sexual behavior and attitudes. The implications would be as a result of cultural, economic as well as social dynamics that exist in every group. The number of completed schooling years for the sample population is quite high for Malawi, 11 years. Men in our sample were mostly literate in Chichewa (98%) and English (86%). The sample is ethnically diverse. It represents Malawi's main tribes namely: Chewa, Ngoni,Tumbuka,and Lomwe and Yao. The Yao's are under represented due to the sampling strategy that was used for the main study. The average age is 27 years.

It is also important to note that there doesn't appear to be differential attrition, that is there are no statistically significant differences between the baseline and follow-up sample in any of the differences presented (Table 1).

It is also important to note that during the follow up study, in addition to administering a questionnaire, at the end of the survey, enumerators gave out of money (30 MKW/or approximately 20 US cents), and offered respondent's the opportunity to purchase condoms. Condoms were sold at 5MKW per pack of three or two MKW for a single condom. The normal retail price for condoms in Malawi is 30MKW per pack of three and single condoms are unavailable for purchase. Respondents were only allowed to purchase a maximum of 18 condoms (6 packs of 30). This method has been used before in this context by Thornton (2008) and Godlonton, Munthali and Thornton (2012). During the follow-up survey 69 percent purchased at least one condom, and on average they purchased 6 condoms.

4. Methods

The main aim of this paper is to compare sexual behavior and attitudes of men (currently urban residents) who spent childhood in rural areas to those who spent childhood in urban areas. To do this we examine the results in 3 different ways. First, we examine how (among current urban residents) sexual behavior differs by place of predominant *area type* (Urban, Peri-Urban, Rural) in which an individual grew up. Second, we examine how sexual behavior differs by predominant *area type* during adolescence. Lastly, we examine how sexual behavior evolves given prolonged time spent in an urban area.

One key concern in drawing these comparisons is that individuals who migrate from rural to urban areas are likely to be distinct along many other dimensions and any sexual behavior differences may simply be due to these other inherent differences. To address this concern, we first compare social and economic demographics of respondents by *area type* to determine whether or not they appear significantly different from each other (in terms of observable characteristics). That is, if we observe significant differences in observable characteristics it is reasonable to assume that there will be omitted variables that we cannot adequately control for.

Table 2 presents summary statistics regarding the sample used split by residence during childhood. The average age of the sample is approximately 27 years, with those that reported to have lived in rural areas most of their childhood period being slightly older – 28 years and those who reported to have predominantly lived in an urban setting approximately 1 year younger – averaging 26 years of age. As noted above, the sample is ethnically diverse. For both groups (those predominantly growing up in urban and rural areas) we do observe lower than population averages for Yao's and Muslims as these groups tend to be circumcised and these were explicitly excluded in the sampling strategy discussed above. Importantly, Table 2 shows that there are not large differences in the observable characteristics among those men who spent most of their childhood in rural and in urban areas. This is also the case if one looks at the differences using place of residence during adolescence. The only notable difference is that the men who grew up in rural areas are slightly older – age is controlled for in all regression analysis.

For the first set of analysis – that is how sexual behavior differs by predominant *area type* place of residence during childhood. We compare a large set of current and past sexual behavior and attitudes. These include: age at sex debut; number of children ever given birth; number of sexual partners in the last month; number of sex partners in the last year; condom use during last sexual encounter; frequency of sex in a week prior to survey team visiting them; frequency of sex in previous month; as well as frequency of sex in the preceding twelve months; probability of abstaining in the previous week, month and year; their own perceptions on their HIV status as well as their self perceived risk of contracting HIV. In trying to understand whether the location in which individuals predominantly resided during childhood has an impact on present sexual behavior and attitudes. In this case present sexual behavior and attitudes are dependent variables. we compare respondents' responses on various sexual behavior questions.

We compare means of dependent variables for each *area type*. We are interested in looking at how significant (both in terms of statistical significance and the magnitude of the difference) are the differences for each of the dependent variables. When we restrict to only the urban/rural comparison we simply compute the difference, and present the p-value associated with this difference. When we compare all 3 area types (urban, peri-urban and rural) then we present the group means by the *area type* and present the p-value of the joint F-test of significance that all three types are the same.

For the second set of analysis – that is how sexual behavior differs by predominant *area type* place of residence during adolescence we conduct a similar approach using the same sexual behavior and attitudinal questions.

For the third set of analysis – we investigate the how behavior differs by the amount of cumulative time spent in urban areas we implement two different methodological approaches. First, we adopt a multiple linear regression approach, where we run the following regression:

$$Y_{ij} = \alpha + \beta_1 Duration + \gamma'X + \varepsilon_{ij}$$

where: Y_{ij} represents a measure of sexual behavior for individual *i* in neighborhood block *j*. We control for a number of covariates including: Marital status, age and level of education. Marital status is proxied for as this was for explicit purposes not asked of respondents. To proxy, I use a measure of whether the respondent reports see his primary sexual partner every day. The key coefficient of interest is β as we are interested in the extent to which behavior differs conditional on the number of years spent in an urban area. Standard errors are clustered by the neighbourhood block the primary sampling unit.

A second approach to examining how behavior differs by duration of stay in an urban area, we implement non-parametric analysis. We implement lowess regression allowing the relationship between sexual behavior and duration of stay to be non-linear.

5. Results

Predominant area type during childhood

Table 3 presents the first key results. This table shows the differences in current adulthood sexual behavior and attitudes by place of residence (rural/urban) during childhood. On average, urban childhood dwellers lose their virginity1 year earlier (aged 18 years) compared to the rural childhood dwellers. The difference is statistically significant at 1 percent level. Also, rural childhood dwellers are reported to at least have a child (54 percent) whilst for the urban childhood dwellers less do have children, (41 percent). This is also statistically different at 1 percent level. This could be a result of earlier marriage for those that grew up in rural areas.

Even for those that are not married, it makes sense for them to have high fertility because of low levels of condom use as indicated in the same table. On average adults that predominantly grew up in urban areas practice safer sex (30 percent of encounters compared to 24 percent in the previous week and about 39 % urban childhood dwellers practiced safe sex compared to 25 percent in the previous month for those that grew up in rural areas). If one is concerned that there is differential bias in self reports of sexual behaviors by these two groups it is assuring to see that the condom purchases mimic these results. Urban childhood dwellers also reported high rate of condom usage from their last sexual encounter (51 percent). This could be the case because urban childhood dwellers are having more sex both in terms of frequency and number of partners. And they eventually realize the risk involved hence the higher use of condoms. This is also very interesting because much as rural childhood dwellers have less sex and less number of sexual partners low condom usage still poses a threat to their health particularly when they move to the city where there is higher prevalence of HIV.

It is very interesting to note that despite low abstinence levels (8 percent), low condom use and high sex frequency, men who lived in rural areas during childhood perceive themselves to be at a low risk of contracting the HIV virus than men who lived in urban areas during childhood period. About 73 percent of those who spent childhood in rural area believe to be at a lower risk compared to 48 percent reported by those who spent childhood in urban area. This is statistically significant at 5 percent level.

Predominant area type during ages 10 to 15 (adolescence)

Table 4 examines the relationship between the place of residence during adolescence and its relationship with adult sexual behavior. This period of time was identified as this is a critical time in learning about puberty, and sexual practices. We find similar results to those presented in Table 3. This is driven by a high correlation between those men that spent this adolescent period in the same location as the location they associate with "most of their childhood". Those who lived in rural areas during adolescence, tend to make their sexual debut slightly later in life, at 19 years, compared to 18 years for the urban counterparts. Over half of them are like to have children (52 percent) against 42 percent for men who spent adolescence in rural areas. These differences are significant at 1 percent level. , and also they are likely to exhibit higher fertility (2.3 children). Significant at the 5 percent level.

Adolescents who grew up in urban areas reported more sexual partners compared to those who grew up in rural area. An average of 1.6 partners for adolescent who lived in urban area compared to 1.3 for their counterparts in the last 12 months and an average of 0.7 compared to 0.6 in the previous month. The life time number of sexual partners is also higher for men who spent their adolescent life in urban area. They have an average of six partners compared to 5 from those who spent their life in rural area. Men who lived in urban during adolescent are abstaining more than those that lived in rural area (15 percent and 9 percent respectively)

In terms of condom usage: Men who spent their adolescent in urban area have high levels of safe sex relatively. Men who spent the adolescent in urban area are 50 percent more likely to have used a condom compared to 43 percent from those who spent adolescence in rural areas. About 72 percent of men who spent adolescent in urban bought condoms at the end of survey interview compared to 64 percent from those that spent adolescence in rural areas. More men who lived in rural areas during adolescence believe perceived themselves to be at a lower risk of contracting HIV relative to others than men who lived their adolescence in urban areas (73 percent and 68 percent respectively) significant at 10% level.

Cumulative duration in an urban area

Understanding the extent and manner in which people change their sexual behavior when migrating from a rural area to an urban area is important especially in the context of high HIV

and high urbanization rates. This set of results explores the relationship of duration of stay in urban area (specifically Lilongwe) on frequency of sex in both a week and a month prior to the survey interview; safe sex encounters of the times these men had sex also measured weekly and monthly prior to interviews; general sexual abstinence; as well as weekly and monthly abstinence; numbers of sexual partners, both life time, yearly , monthly and weekly prior to interview; condom use in the last sexual encounter, willingness to purchase subsidized condom after interview, as well as number of condoms bought. We controlled for number of years of schooling, age, and marital status. The survey did not ask whether or not the men were married to try to allow men to talk more freely about all sexual partners. One does expect condom usage patterns to be quite different for married and single men. To proxy for marital status – we use a simple age cutoff of 26. A low fraction of men younger than 25 are likely married, and a high fraction of men older than 25 will be married. Future work will explore using other measures to proxy for marital status.

Table 5 presents the regression results. We find that for every additional year one lived in an urban area, the probability of abstaining from sex increases by 1 percentage point (not statistically significant). Among sexually active men, the probability of abstaining decreses by 3 percentage points and 1 percentage point for every additional year for a month and a week respectively. This means that having already had sex and staying in urban area increases the probability of engaging in more sexual activity whilst if one has never had sex and stays in urban area, there is a good chance of prolonging his abstinence the more he stays in urban area.

Table 5, also shows interesting results related to duration of stay in the urban area and condom usage. Recall that safe sex refers to using condom when having sex. We find that for every additional year spent in urban area, men increase the proportion of safe sex acts by 4 percentage points and 3 percentage points per week and month respectively prior to the survey interview. These are statistically significant. Similarly, length of residence in urban area is also related to willingness to buy at least a condom at the end of the survey interview. For every additional year living in town, the probability of buying a condom increases by 4 percentage points (it is also significant at 5% level). There is also a strong relationship between length of stay in urban area and number of condoms bought at the end of survey interview. For every additional year a man lived in urban area, he bought on average 6 percentage points more

condoms. This is significant at 1 % level. Recall that the maximum number of condoms bought was 18. This coefficient estimate suggests that for every additional 16 years resident in town, they would buy one more condom on average. This coefficient is likely an underestimate, given that respondents were restricted in the number of condoms they could purchase.

Interestingly, for every additional year spent in Lilongwe, the number of sexual partners in the previous year increases on average by 2 percentage points. Number of lifetime sexual partners on average increases by a staggering 12.6 percentage points more with every additional year spent n urban area. This is statistically significant at 1 % and large in magnitude. This suggests that in part the condom use is in part compensating for increased risky sexual behavior in terms of the number of partners.

Figures 1 through 3 present the non-parametric analysis. These allow for a non-linear relationship between the variables of interest and the duration of stay in Lilongwe. For the purposes of these graphs we construct a modified variable to capture the duration of stay in the urban center – that is we compute the fraction of the individual's lifetime resident in the city.

Figure 1 presents the relationship between abstinence in the last month and how long the individual has lived in the city. Among older men (likely married), there doesn't appear to be large differences in abstinence regardless of how long they have lived in the city. Among younger men (likely unmarried) we observe a declining trend. That is, the longer the individual has lived in the city the less likely he is to abstain. One possible explanation is that men more familiar with the city find it easier to find sexual partners.

Figure 2 presents a similar figure using the measure of safe sex acts over the last week. That is it presents the relationship between the fraction of sexual encounters that the man reports using a condom in the last week and the fraction of his lifetime that he has resided in the city. In this case we are restricting to sexual behavior the week prior to the survey. For all men we see that there is sharp increase in safe sex as one's cumulative amount of time lived in Lilongwe lengthens. It appears to plateau for individuals who have spent between 20 and 50 percent of their life in the city and then steadily increases for those who are long term residents in the city. For the older men (older than 25) the initial increase in condom adoption is not as rapid. On average older men exhibit lower condom use although the general pattern is similar. This is

unsurprising as a large fraction of these men are likely married and within marriage condom use is low.

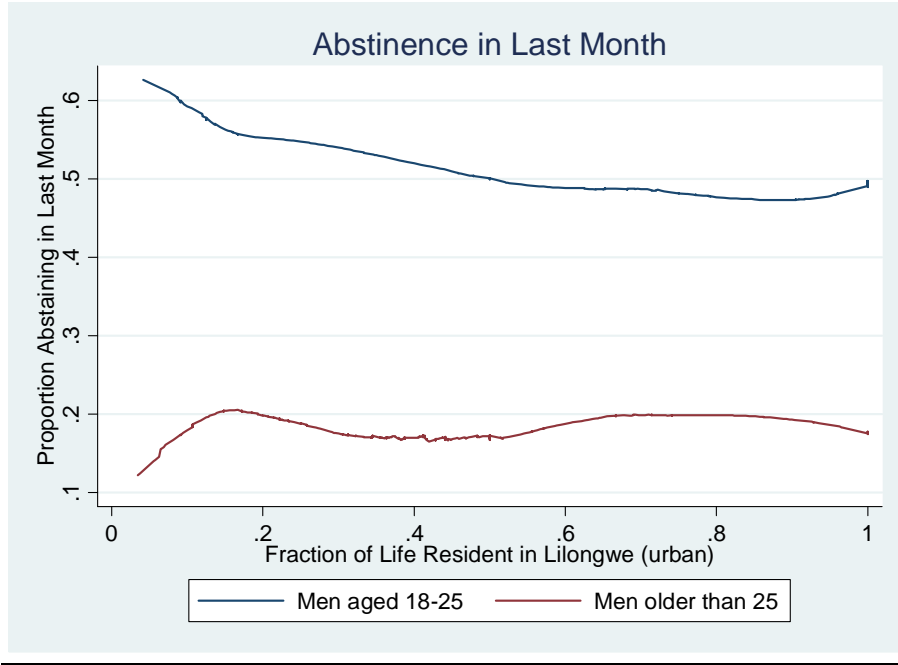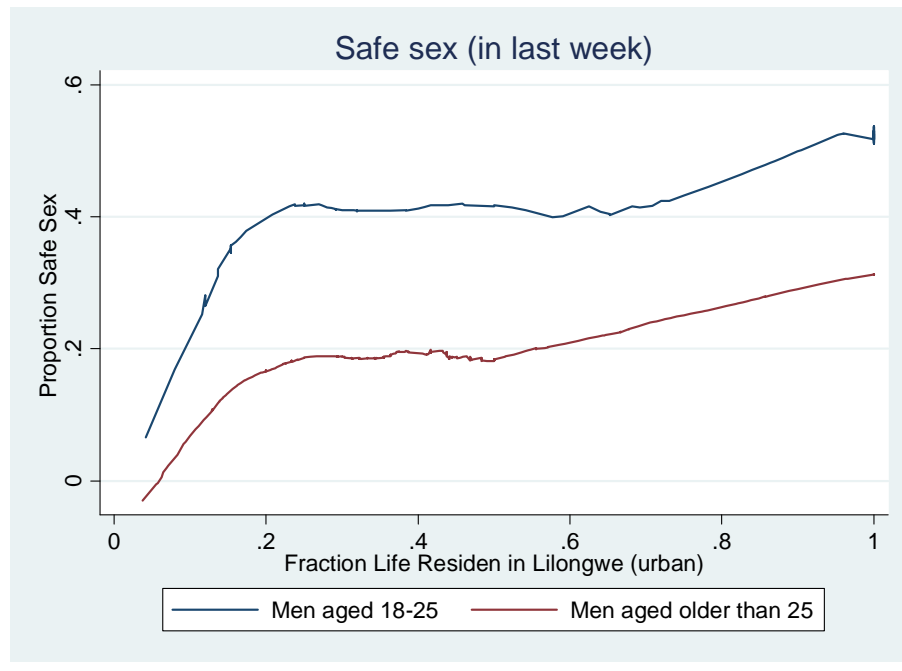**Figure 1: Abstinence in Last Month by Cumulative Time in Lilongwe**

Figure 2: Safe Sex by Cumulative Time in Lilongwe

6. Conclusion

This paper reported on the relationship between childhood and adolescent place of residence on adulthood health. Men raised predominantly in rural areas, initiate sex later (approximately 1 year later than those raised predominantly in urban areas), but experience fertility (2.2 children),and have more sex but still perceive themselves to be at a lower risk of contracting HIV relative to others. It also examined the relationship between cumulative amounts of time spent in an urban area with sexual behavior. This relationship shows that the longer a man stays in urban area, the higher the chance of practicing safe sex (condom use); the higher the chance of him not abstaining from sex but also increase in sexual activity. The relationship between sexual behavior practices and the cumulative amount of time lived in an urban area shows that the longer an individual resides in an urban area the more frequently he will use a condom during sex (the fraction of safe sex encounters increases). These results are more pronounced among unmarried men. This suggests that migrants adjust their behavior over time but it is a relatively slow adjustment.

This finding has important policy considerations - in a context with high HIV rates (higher in rural areas) and a high urbanization rate it suggests that HIV prevention policies should be targeted to such groups to accelerate this condom adoption process. Future work will explore the robustness of these findings, more thoroughly control for observed characteristics, and explore other dimensions of sexual behavior. It will also try to explore how attitudes change with amount of time spent in the city to shed some light on why rural migrants adopt so slowly to increased contraceptive usage.

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Table 1: Sample and Attrition

Background:		Baseline N=1640		Sample Used N= 1,238		
		Mean (1)	SD (2)	Mean (3)	SD (4)	Difference (5)
	Age	26.717	5.872	26.779	5.849	-0.062
	Years of Education	11.051	2.473	11.078	2.369	-0.028
	Literacy in Chichewa	0.971	0.169	0.978	0.147	-0.007
	Literacy in English	0.879	0.327	0.861	0.346	0.018
Ethnicity	Chewa	0.330	0.471	0.338	0.473	-0.008
	Lomwe	0.139	0.346	0.131	0.338	0.008
	Abstinence	0.126	0.332	0.151	0.083	-0.025
	Tumbuka	0.130	0.337	0.123	0.329	0.007
	Yao	0.039	0.194	0.038	0.191	0.001
Religion						
	Christian	0.948	0.948	0.944	0.231	0.004
	Muslim	0.009	0.096	0.011	0.103	-0.001

Notes:

Only men who were uncircumised were included at baseline and consequently followed during follow up.

Table 2: Summary Statistics: General demographics and demographics by main place of residence during childhood

Background:	Comparison Rural to Urban			Comparison Urban, Peri-urban and Rural			
	Urban N=765	Rural N=375	Difference	Urban N=765	Peri-urban N=99	Rural N=375	p-value of F-stat
	(1)	(2)	(3)	(1)	(2)	(3)	(4)
Age	26.297	27.692	1.411***	26.297	26.695	27.692	0.002
Years of Education	11.274	10.548	-0.722	11.274	11.268	10.548	0.003
Literacy in Chichewa	0.983	0.968	-0.015	0.983	0.969	0.968	0.486
Literacy in English	0.879	0.802	-0.077	0.879	0.898	0.802	0.005
Ethnicity:							
Chewa	0.340	0.353	0.016	0.340	0.316	0.353	0.701
Lomwe	0.121	0.136	0.016	0.121	0.184	0.136	0.153
Abstinence	0.126	0.332	0.151	0.083	0.235	0.198	0.094
Tumbuka	0.119	0.142	0.022	0.119	0.082	0.142	0.176
Yao	0.039	0.024	-0.017	0.039	0.071	0.024	0.100
Religion:							
Christian	0.951	0.928	-0.024	0.948	0.927	0.928	0.275
Muslim	0.012	0.008	-0.004	0.012	0.000	0.008	0.008

Table 3. Summary Statistics: Sexual Behaviour and Childhood Place of Residence

	ALL		Comparison Rural to Urban			Comparison Urban, Peri-urban and Rural			
	Mean	SD	Urban N = 765	Rural N = 375	Difference	Urban N = 765	Peri-urban N =99	Rural N = 375	p-value of F-stat
Sexual Behavior:	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Age at sexual debut	18.404	3.641	18.032	18.798	0.783***	18.032	18.733	18.798	0.038
Fathered any children	0.454	0.498	0.409	0.537	0.130***	0.409	0.495	0.537	0.001
Number of children (conditional on having any	2.137	0.854	2.117	2.220	0.0980**	2.117	2.091	2.220	0.482
Number of sex partners in the past 12 months	1.540	2.437	1.626	1.299	-0.329	1.626	1.760	1.299	0.049
Number of sex partners in the past month	0.667	0.903	0.679	0.650	-0.032	0.679	0.722	0.650	0.670
Number of sexual partners across lifetime	5.724	10.943	6.329	4.894	-1.440	6.329	4.688	4.894	0.010
No STI symptom in last few weeks	0.103	0.304	0.109	0.115	0.006	0.109	0.092	0.115	0.828
Frequency of sex in the last week	3.509	2.839	3.490	3.606	0.115	3.490	3.250	3.606	0.590
Frequency of sex in the last month	10.881	10.881	10.564	10.782	0.218	10.564	13.477	10.782	0.070
Abstinence	0.126	0.332	0.151	0.083	0.067	0.151	0.094	0.083	2.190
Condom Use:									
Fraction safe sex last week	0.250	0.405	0.304	0.243	0.061	0.304	0.162	0.243	0.001
Fraction safe sex last month	0.344	0.426	0.390	0.255	0.135	0.390	0.366	0.255	0.001
Used condom last sex	0.475	0.500	0.513	0.395	0.117	0.513	0.489	0.395	0.001
Purchased any condoms	0.688	0.464	0.710	0.657	0.053	0.710	0.643	0.657	0.104
Number of condoms purchased	6.083	6.577	6.328	5.859	0.469	6.328	5.124	5.859	0.066
Attitudes:									
Self-percieved HIV status									
No likelihood	0.423	0.494	0.437	0.473	0.035	0.437	0.459	0.473	0.709
Low likelihood	0.278	0.448	0.290	0.291	-0.001	0.290	0.357	0.291	0.520
Medium likelihood	0.091	0.287	0.104	0.091	-0.013	0.104	0.061	0.091	0.231
High likelihood (or confirmed HIV+)	0.122	0.327	0.130	0.131	0.001	0.130	0.122	0.131	0.935
Perceived risk of HIV relative to others									
Higher risk	0.129	0.335	0.150	0.128	-0.021	0.150	0.071	0.128	0.142
Lower risk	0.657	0.475	0.672	0.730	0.056**	0.672	0.776	0.730	0.021
Equivalent risk	0.145	0.353	0.164	0.136	-0.029	0.164	0.153	0.136	0.165
Ever had an HIV test	0.704	0.460	0.697	0.705	0.006	0.697	0.764	0.705	0.235

Notes:

Safe sex is defined as the fraction of sex acts in which a condom was used. Fraction of safe sex refers to number of times a condom was used when having sex out of all sexual encounters.STI symptom include, strange discharge from the penis,any wound around sexual organ, feeling pain whilst unrinating.

Table 4: Summary Statistics: Sexual behaviour and place of residence between ages of 10 to 15

	Comparison Rural to Urban			Comparison Urban, Peri-urban and Rural			
	Urban	Rural		Urban	Peri-urban	Rural	
							p-value of
	N = 765	N = 375	Difference	N = 765	N =99	N = 375	F-stat
Sexual Behavior:	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Age at sexual debut	18.014	18.799	0.797***	18.014	18.860	18.799	0.055
Fathered any children	0.418	0.518	0.102***	0.418	0.491	0.518	0.014
Number of children (conditional on having any)	2.106	2.273	0.160**	2.106	2.000	2.273	0.058
Number of sex partners in the past 12 months	1.603	1.312	-0.295	1.603	1.830	1.312	0.699
Number of sex partners in the past month	0.673	0.640	-0.036	0.673	0.783	0.640	0.749
Number of sexual partners across lifetime	6.300	4.676	-1.634	6.300	5.642	4.676	0.143
No STI symptom in last few weeks	0.108	0.114	0.005	0.108	0.101	0.114	0.898
frequency of sex in the last week	3.461	3.693	0.232	3.461	3.128	3.693	0.590
frequency of sex in the last month	10.574	11.185	0.611	10.574	11.702	11.185	1.590
abstinence	0.146	0.090	0.056	0.151	0.113	0.090	0.510
Condom Use:							
Fraction safe sex last week	0.288	0.268	-0.076	0.288	0.268	0.268	0.010
Fraction safe sex last month	0.384	0.254	-0.131	0.384	0.387	0.254	0.000
Used condom last sex	0.501	0.426	-0.076	0.501	0.467	0.426	0.030
Purchased any condoms	0.717	0.638	-0.079	0.717	0.657	0.638	0.021
Number of condoms purchased	6.388	5.497	-0.886	6.388	5.972	5.497	0.059
Attitudes:							
Self-percieved HIV status							
No likelihood	0.450	0.472	0.020	0.450	0.376	0.472	0.130
Low likelihood	0.291	0.287	-0.005	0.291	0.358	0.287	0.432
Medium likelihood	0.096	0.089	-0.007	0.096	0.119	0.089	0.508
High likelihood (or confirmed HIV+)	0.127	0.133	0.006	0.127	0.138	0.133	0.821
Perceived risk of HIV relative to others							
Higher risk	0.143	0.133	-0.010	0.143	0.110	0.133	0.777
Lower risk	0.682	0.726	0.043*	0.682	0.716	0.726	0.368
Equivalent risk	0.160	0.138	-0.023	0.160	0.174	0.138	0.449
Ever had an HIV test	0.699	0.707	0.007	0.699	0.734	0.707	0.649

Notes:

Safe sex is defined as the fraction of sex acts in which a condom was used. Fraction of safe sex refers to number of times a condom was used when having sex out of all sexual encounters. STI symptom include, strange discharge from the penis, any wound around sexual organ, feeling pain whilst unrinating.

Table 2: Relationship of duration of stay in urban area and Sexual Behavior

	Number of condoms bought	Fraction of safe sex last month	Fraction of safe sex last week	Used condom in the last sexual encounter	bought any condom after interview	Has never had sex before	lifetime number of sexual partners	reported any STI symptom	Abstain sex last month	Abstain sex last year	Sex frquency in the last week	Sex frequency in the last month
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Duation of stay in lilongwe	0.060***	0.003*	0.004*	0.002	0.004**	0.001	0.126***	0.000	-0.003*	-0.001*	-0.016	-0.031
	[0.021]	[0.002]	[0.002]	[0.001]	[0.002]	[0.001]	[0.040]	[0.001]	[0.001]	[0.001]	[0.019]	[0.032]
Age	-0.006	-0.014***	-0.012**	-0.014**	-0.008***	-0.012**	0.172	0.005	-0.009**	-0.004**	-0.101	0.122*
	[0.056]	[0.005]	[0.005]	[0.005]	[0.003]	[0.005]	[0.120]	[0.003]	[0.003]	[0.002]	[0.102]	[0.066]
Years of education	0.019	0.004	-0.002	0.004	-0.006	0.011***	-0.325	-0.016***	0.011*	0.002	-0.111**	-0.099
	[0.092]	[0.006]	[0.006]	[0.006]	[0.006]	[0.003]	[0.196]	[0.005]	[0.006]	[0.004]	[0.051]	[0.095]
Married	0.226	-0.140***	-0.097	-0.206***	0.024	-0.093*	1.427	-0.027	-0.240***	-0.068***	0.211	2.468***
	[0.628]	[0.053]	[0.060]	[0.055]	[0.042]	[0.051]	[1.410]	[0.029]	[0.043]	[0.017]	[0.466]	[0.813]
Constant	5.056***	0.757***	0.629***	0.903***	0.916***	0.352***	2.461	0.155*	0.592***	0.213***	8.012***	5.278**
	[1.729]	[0.128]	[0.146]	[0.148]	[0.109]	[0.129]	[3.443]	[0.083]	[0.094]	[0.061]	[2.977]	[1.985]
Observations	1,190	764	497	1,125	1,193	1,204	1,206	1,216	1,216	1,216	504	770
R-squared	0.007	0.103	0.062	0.121	0.013	0.109	0.037	0.018	0.134	0.047	0.014	0.043

Notes:

Robust standard errors clustered by block in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%