

Do household economic shocks influence sexual behavior choices? Evidence from the Cape Area Panel Study

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Research questions and motivation

Measured HIV/AIDS prevalence is highest in some of the poorest populations in the world: 63% of the 38.6 million people living with HIV/AIDS live in sub-Saharan Africa.¹ In many African countries, prevalence is often higher for poorer individuals and communities. While some of this difference is no doubt due to poverty-induced biological vulnerabilities (e.g. high prevalence of untreated STI's), there is also a behavioral aspect to HIV/AIDS that information campaigns try to target. If policy makers could more better understand some of the channels through which poverty affects choices about sexual behavior, they could find new ways to decrease the rate of new infections that go beyond providing information. However, since there is often positive feedback between poverty and many types of infectious disease, it is always difficult to pin down how income and disadvantage directly affect disease vulnerability.

In this paper, we move some way towards pinning down this link by asking: how much does household income protect against risky changes in sexual behaviors for young people entering the sexual marketplace? To what extent are young people more likely to transition to risky sexual behaviors when their households experience large negative economic shocks? Are these income and shock effects different for boys and girls? These questions are particularly pertinent in the context of the generalized HIV/AIDS epidemic in South Africa, where 15.5% of girls and 4.8% of boys aged 15 to 24 are HIV+.[5]

Related literature

There is a small literature in economics that examines how economic factors affect risky sexual behaviors. This literature generally focuses on measuring reported condom use in formal sex work markets. Two papers measure the compensating differential that formal

¹Data are from www.avert.org/worldstats.html.

sex workers are willing to accept in order to engage in sex without a condom. Rao, Gupta, Loshkin and Jana (2003)² measures the price of risky sex for commercial sex workers in Calcutta, India. They use access to information as an instrumental variable (IV) for condom use and find that sex workers who always use condoms incur large losses of over 60% per sex act. Gertler, Shah and Bertozzi (2005)³ use panel data from two Mexican states to estimate sex worker-fixed effects models of the price of unprotected sex: they compare prices that the same sex worker charges to different clients for sex with and without a condom. They measure the risky sex premium at 23%.

Luke (2006)⁴ takes this idea to a less formal market. Using her own data on men aged 21-45 years in Kisumu, Kenya, she presents convincing evidence that there is a market for risky sex even in informal relationships. By comparing the use of condoms (her measure of safe sex) by the same man across men partnerships with different levels of transfers (using a male-fixed effect model), she finds that partnerships involving higher transfers are strongly and significantly associated with lower probabilities of safe sex. Luke (2006)⁵ suggests that the reason why women are willing to make such a trade off may be related to poverty or to the consumption demands of these women, and concludes with a call for more evidence to be marshalled on this point.

Each of these papers highlights (and tries to solve) the difficulty of inferring the effects of resources on sexual behaviors. The authors are all concerned with netting out unobserved individual risk preferences that may contaminate comparisons of behavior across high and low priced sex workers, or across partnerships involving large and small gifts. This endogeneity plagues any cross sectional study that aims to isolate the impact of money on behavior. Our contribution to this literature comes from the ability to go beyond the cross sectional comparisons and to focus on an under-researched group of individuals: young girls and boys aged 14 to 22 who are just entering the sexual marketplace. We look at changes in sexual behaviors over time, which allows us to difference away any individual-specific fixed effect. Our data also allow us to focus on an expanded range of outcomes rather than just condom use.

Data

We employ new longitudinal survey data from an urban setting in South Africa to probe the links between income and reproductive health behaviors more closely. The Cape Area Panel Study (CAPS) is a longitudinal survey of young adults in Cape Town. The study focuses on a wide range of issues affecting young adults and their households, including schooling, work, household living arrangements, and reproductive health. The first wave of CAPS was collected in 2002, with roughly 4,800 young adults aged 14-22 being interviewed. In 2005, about 3,500 of these youths were re-surveyed. Table 1 indicates the weighted and unweighted

²[4]

³[1]

⁴[3]

⁵[3]

sex and racial break down of the sample. African and White youths are oversampled in this survey to achieve a racial distribution of young adults that matches the 2001 Census distribution; thus all data analysis will use sample weights to correct for this [2].

Our sample of interest includes African and Coloured youths who are surveyed in both waves of the panel. We exclude White youths because of the much lower response rate in 2005 (only 56% were re-surveyed), and because the sample size for Whites is low even in wave 1. Table 2 indicates that the matched sample consists of 2989 youths in 2182 households in 2002.⁶ This table also describes some of the characteristics of these youths: about 30% of the sample is African, and the average age is 17.78 years in 2002. Many of these young people live in very poor households: 33% of them live in households with at least one social grant (a pension, child support grant, disability grant or other) and this percentage increases to 44% in 2005. While mean per capita household income doesn't vary substantially between waves, the proportion of individuals with missing income data does. Our analysis will experiment with dummies for missing income as well as income imputations from Census data so as not to omit households with no income information.

Information on economic shocks in the few years before the survey was asked in 2002 and 2005. However, the timing of shocks is only captured in 2005 and so we focus on the impact of these shocks on behavior. Table 2 indicates that over 35% of young adults lived in households that experienced at least 1 negative income shock in the years 2002-2005; the vast majority of these shocks are through death, illness and job loss.

The outcomes we measure include: sexual debut (a binary variable), the number of sex partners in the last year (specified as a count variable as well as collapsed into a binary variable), condom use at last sex (a binary variable) and age gaps of each partner in the partnership history (a count variable). Using data from both waves of the panel, we can construct changes in outcome variables to measure the transitions that these young people are making in their sexual relationships.

Methods and preliminary analysis

Panel data allow us to model transitions in sexual behaviors explicitly, rather than inferring changes from variation in a cross section. Specifically, we will consider the following model:

$$\Delta y_{ijt} = \alpha_0 + \alpha_1 X_{ijt-1} + \alpha_2 Resources_{jt-1} + \epsilon_{ijt} \quad (1)$$

where i is the individual, j is the household and t is the year; y is the behavioral outcome, X_{ijt-1} is a set of demographic characteristics (age, race, education) and $Resources$ is either the log of household income in $t - 1$ or the existence of a negative economic shock in the period between $t - 1$ and t .⁷ Estimation will proceed by OLS regressions and probit models where appropriate, and it will be sensible to run the models separately for males and females.

⁶The final paper will include an analysis of the observable factors driving attrition in the panel.

⁷We will experiment with various non-linear specifications for income as well as different ways of incorporating the shock information into the model.

Note that using the panel data has benefits in addition to being able to model the transition in behaviors. Firstly, if we think that there are individual-specific fixed effects that drive a young person to systematically over- or under-report their sexual behaviors (e.g. inflate number of partners, or exaggerate condom use), then taking the change in their reports should give us a more reliable measure of behavior than simply considering levels. Secondly, having data on the dates of shocks as well as the dates of sexual relationships helps with sequencing the shocks before the changes in behavior; something that cross sectional data cannot do. Thirdly, information from the first wave can be used to control for pre-existing differences between individuals in their individual and household characteristics. In other words, using baseline data allows us to select a comparable set of households in which only some experience negative income shocks by 2005.

Figures 1 to 4 and Table 3 present some initial information about changes in sexual behaviors in our sample and the incidence of negative income shocks by baseline income quintile. Figures 1a-1d indicate that as these youths age, the probability of sexual debut increases, but that between waves, sexual debut is happening more often for each age. Racial and sex patterns are interesting - higher proportions of African females and African and Coloured males are debuting before the age of 18, while Coloured females tend to debut more often when older than 18.

Table 3 reports on the age of the first sex partner by race-sex group and own age in 2002. Almost consistently, African males of all ages report that their first partner was around 14 years of age. Combined with Figure 1a, this suggests that many African boys are starting to have sex when they are young (under 17 years) and their partners are younger than they are. Who these young women are will be a question for the descriptive piece of our paper, as Figure 1b suggests that very few African girls are sexually active at age 14.

Condom use at last sex is consistently higher in 2005 than in 2002 for African youths, and somewhat higher for older Coloured females in 2005 as figures 2a-2d indicate. One of the questions we will ask is to what extent marriage can explain the differences in condom use across Coloured and African populations. Figures 3a-3b also indicate some good news: as these youths age (both individually and as a cohort), the probability of having more than one partner in the past year is falling quite substantially in some cases. Our data may shed light on the extent to which economic hardship (or the absence of hardship) can explain this shift.

Finally, figure 4 indicates the prevalence of household level economic shocks in the 2002 to 2005 period, conditional on household per capita income quintile in 2002. It is notable that the incidence of shocks from death, illness or job loss affects households across all of the quintiles. However, it is also clear that death and illness shocks are more likely to occur in lower quintiles. Our analysis will take this into account when modeling transitions as we want to be sure not to compare (poor) households with shocks to (rich) households without shocks, as their underlying wealth differences may drive any differences in behavioral changes.

Expected results

Using the panel data as described above should shed light on whether income or income shocks influence behavioral change, and if so, to what extent. We should also be able to test for gender differences in the channels which link economic resources to risky sexual choices by estimating separate models for each group. Finally, we should be able to confirm whether the negative cross-sectional correlation between income and vulnerability to HIV/AIDS survives when we control for background characteristics that are correlated with unobservables.

References

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Table 1: Composition of CAPS wave 1 (2002) and wave 3 (2005) sample

Population Group	Number of households	Number of young adults	Unweighted percent	Weighted percent	Percent YA's followed up?
Black/African	1,442	2,151	45.3	28.2	
Coloured	1,412	2,002	42.1	53.1	
White	450	599	12.6	18.7	
Total	3,304	4,752	100	100	
Black/African	1,122	1,516	43.12	26.51	0.70
Coloured	1,314	1,665	47.35	59.2	0.83
White	273	335	9.53	14.3	0.56
Total	2,709	3,516		100	

Table 2: Descriptive statistics of the sample

x variable	2002	2005
female	0.517	
age	17.788	
African	0.303	
years of education	9.272	10.537
Income		
log pc hh income	6.206	6.245
pc hh income missing	0.040	0.192
Grants		
grant receipts		
pension	0.159	0.182
csg/cmfg	0.107	0.106
disability	0.102	0.239
foster		0.025
at least 1 grant	0.330	0.444
Incidence of shocks		
death	0.174	0.124
illness	0.149	0.091
job loss	0.197	0.179
fire/theft	0.087	0.029
failed business	0.020	0.013
loss of fin support	0.050	0.005
divorce	0.029	0.023
loss of grant		0.011
at least 1 shock	0.479	0.355
N kids	2989	2989
N hh	2181	2273

All means are weighted by the individual youth weight. The sample consists of African and Coloured young adults who were observed in 2002 and in 2005 with completed questionnaires. Data is presented for individuals; thus the household means represent the proportion of YA's living in households with characteristic X. In 2002, the options "foster care grant" and "loss of a grant" were not separate responses.

Table 3 : Reported age of first partner, by own age in 2002

Own age	Age of first sexual partner			
	African male	African female	Coloured male	Coloured female
14	13.07	14.46	14.91	17.52
15	12.74	17.33	14.10	20.71
16	13.37	17.44	15.50	18.52
17	14.34	18.89	15.48	21.19
18	13.78	18.55	16.22	20.67
19	14.63	19.33	16.51	20.90
20	14.49	19.74	17.25	19.40
21	14.89	19.49	17.30	21.41
22	14.96	20.09	16.63	20.51

Notes: the sample is the set of African and Coloured YA's who have completed questionnaires in both waves and who report that they have ever had sex and who provide a response to the question: what was the age of your first sexual partner.

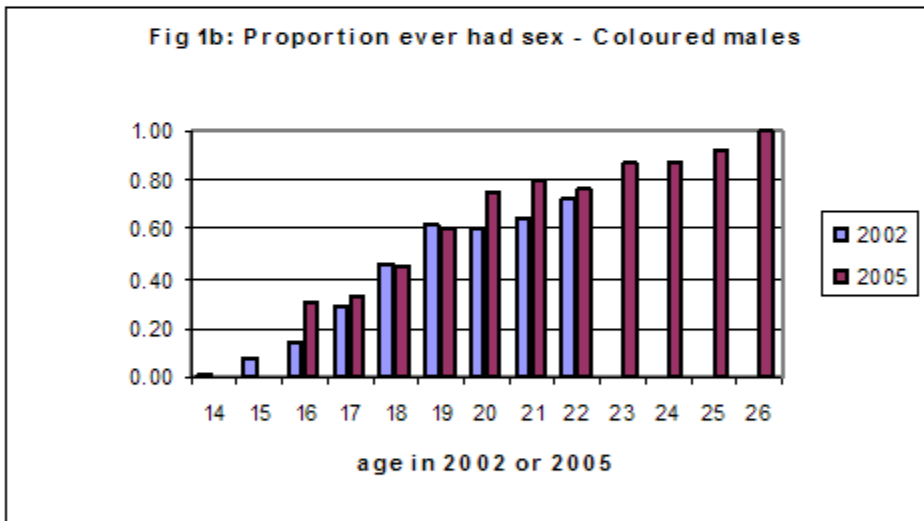
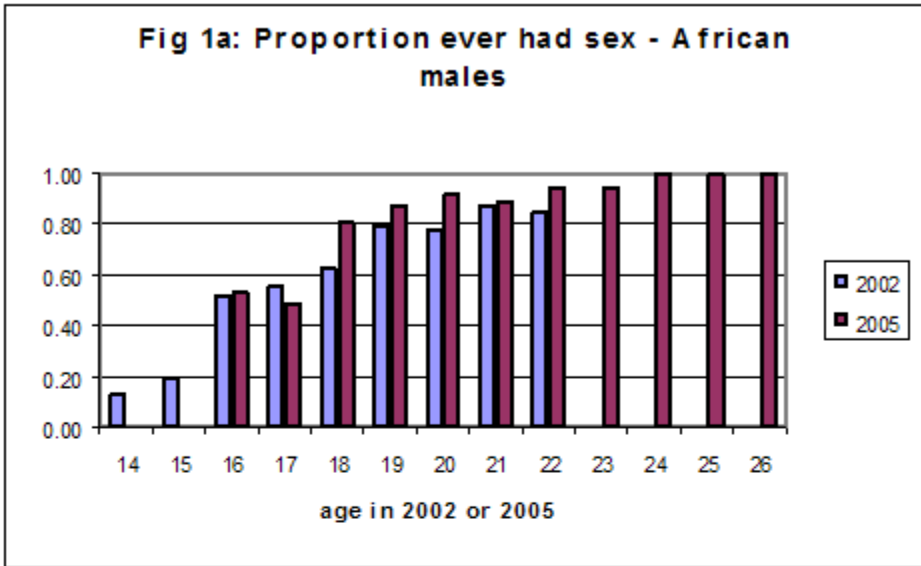


Fig 2a: Proportion using condom at last sex - African males

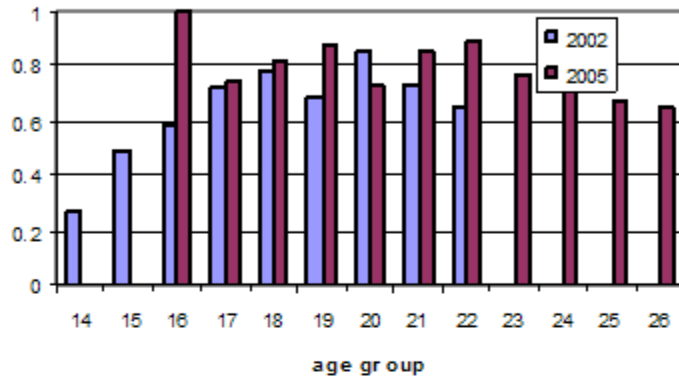


Fig 2b: Proportion using condom at last sex - Coloured males

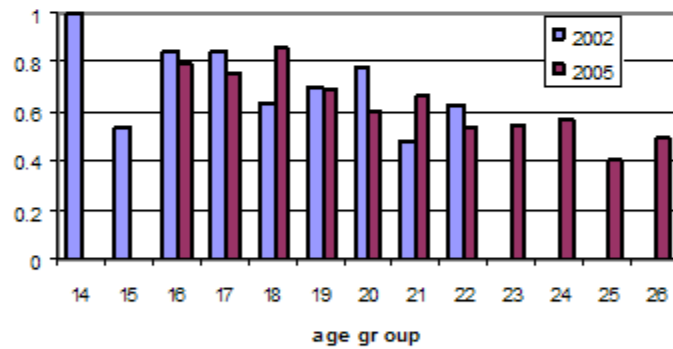


Fig 2c: Proportion using condom at last sex - African females

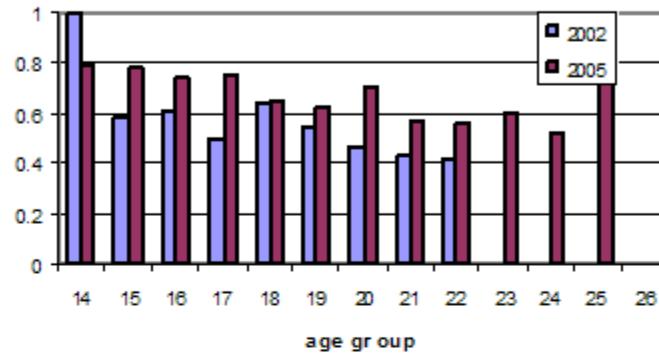


Fig 2d: Proportion using condom at last sex - Coloured females

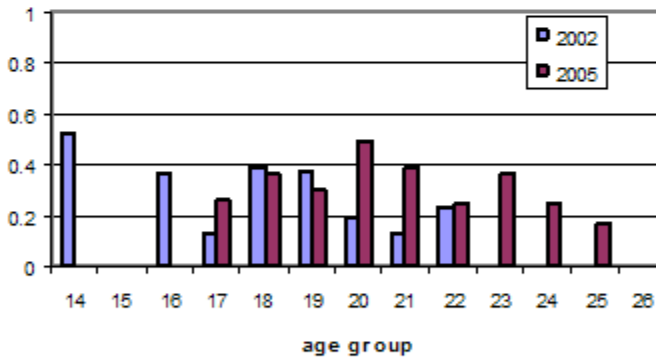


Fig 3a: Number of sex partners in past year: African males



Fig 3b: Number of sex partners in past year: African females

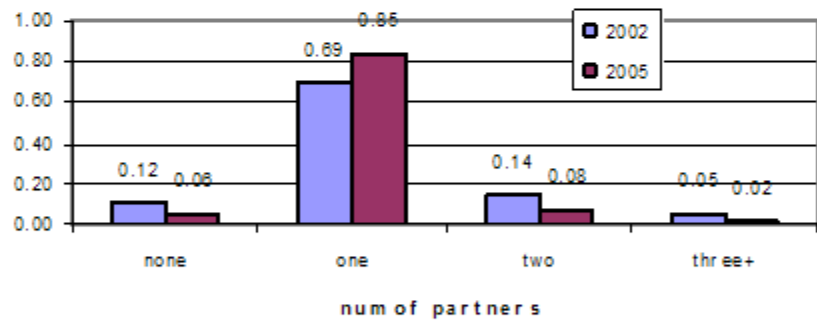


Fig 3c: Number of sex partners in past year: Coloured males

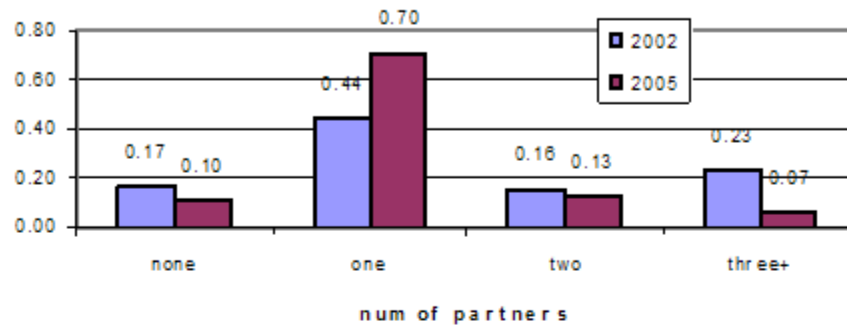


Fig 3d: Number of sex partners in past year: Coloured females

