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Economic context and HIV vulnerability in adolescents and young adults living in urban slums in Kenya: a qualitative analysis based on scarcity theory

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Abstract

Urban slum adolescents and young adults have disproportionately high rates of HIV compared to rural and non-slum urban youth. Yet, few studies have examined youth's perceptions of the economic drivers of HIV. Informed by traditional and behavioral economics, we applied a scarcity theoretical framework to qualitatively examine how poverty influences sexual risk behaviors among adolescents and young adults. Focus group discussions with one hundred twenty youth in

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Compliance with Ethical Standards:

Conflict of Interest

The authors declare that they have no conflict of interest.

Research Involving Human Participants and/or Animals

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.

Informed Consent

Informed consent was obtained from all individual participants included in the study.

Kenyan's urban slums were transcribed, coded, and analyzed using interpretive phenomenology. Results indicated that slum youth made many sexual decisions considered rational from a traditional economics perspective, such as acquiring more sex when resources were available, maximizing wealth through sex, being price-sensitive to costs of condoms or testing services, and taking more risks when protected from adverse sexual consequences. Youth's engagement in sexual risk behaviors was also motivated by scarcity phenomena explained by behavioral economics, such as compensating for sex lost during scarce periods (*risk-seeking*), valuing economic gains over HIV risks (*tunneling*, *bandwidth tax*), and transacting sex as an investment strategy (*internal referencing*). When scarcity was alleviated, young women additionally described reducing the number of sex partners to account for non-economic preferences (*slack*). Prevention strategies should address the traditional and behavioral economics of the HIV epidemic.

Keywords

scarcity; economic; HIV; prevention; urban slum; adolescents; young adults; Kenya; qualitative

Introduction

Much has been studied regarding the relationship between poverty and vulnerability to HIV [1–4]. Previous research has shown that persons living with HIV are often significantly impoverished by the economic shocks of HIV infection such as lost wages and costs associated with routine and catastrophic treatment of HIV disease [5–8]. In addition, several studies have shown that poverty-related factors such as debt, unemployment, income and food insecurity, as well as absence of financial support have all been associated with engagement in sexual behaviors that increase risk of acquiring HIV [9–19]. These behaviors include unprotected sex [10–14], inconsistent condom use [15], transactional sex [14, 16–18], and multiple sexual partners [14, 18, 19]. Public health scientists have proposed several potential pathways between poverty and HIV, including misinformation within impoverished communities regarding condom use [20, 21], lack of resources to afford or negotiate condom use [21, 22–25], or reliance among lower-income residents on transactional sex due to limited other livelihood activities [26–31]. However, while these studies have broadened our understanding of economic factors associated with HIV risk, many have been limited by a focus on quantifying relative probabilities of sexual risk behaviors in absence of explanatory narratives by participants themselves. A growing number of qualitative studies have examined the social contexts of HIV vulnerability in resource-poor settings [32–34], but none have applied traditional or behavioral economic theories to interpret findings. This has hindered the development of combination prevention strategies among young people that reflect a deeper understanding of how economic experiences of the poor influence HIV-related behaviors in urban slums.

Economics is the study of how individuals and societies make choices when resources are scarce [35], where scarcity is defined as a condition of insufficient or short supply [35]. A scarcity lens has increasingly been applied to HIV care and treatment in examining the impact of resource scarcity on the provision of free antiretroviral therapies [36], adequacy of food aid to persons living with HIV (PLWH) [37], remuneration of HIV medical staff [38],

and quality of care to PLWHs [39], but less has been applied to HIV prevention and the reduction of sexual risk behaviors. The concept of scarcity is at the center of traditional economics, in which individuals rely on rational decision-making in regards to tangible resources to optimize their benefit. However, behavioral economics adds a more nuanced examination of scarcity that integrates psychology and economics, focusing not only on the physical effects of poverty such as homelessness, hunger, or unemployment, but also on the psychological consequences of resource scarcity such as distress, anxiety, or cognition [40, 41]. While traditional economic theory posits that individuals make fully informed, rational decisions that maximize their wealth and self-interests, the field of behavioral economics argues that individuals as a result of limited information and processing ability, make suboptimal or irrational judgments with known negative effects that reflect other social, temporal, emotional, and economic preferences [42–45].

In their discourse on the behavioral economics of scarcity, Mullainathan & Shafir (2013) describe six behavioral phenomena that emerge when people experience scarcity, defined as both real and perceived deficiency, primarily in the form of insufficient financial resources [46]. One phenomenon is that scarcity preoccupies a person's thoughts on financial decision-making and reduces the available cognitive capacity or "bandwidth" to reason and retain information for other types of decisions. When people are distracted by financial worries, the resultant *bandwidth tax* means they are less able to process information in other areas to make decisions [40, 46–49]. Secondly, as their most prominent financial needs gain their attention, it leads them to neglect or *tunnel out* less prominent needs and consequences which results in decisions that may have harmful effects [41, 46, 48]. Such pressing financial need can also result in a third phenomenon of *myopic borrowing* when a person, biased towards present concerns, obtains resources on loan with less consideration of how to return the equivalent resources in the future [46]. Economists commonly refer to this as present bias, a tendency to overly discount future rewards and focus on current temptations at the expense of long-term goals, which can result in self-reinforcing behaviors that lead to persistent scarcity, also known as the "poverty trap" [50–52]. Individuals who perceive that their resources are inadequate relative to their needs also encounter a fourth phenomenon of *heightened concern of opportunity costs* where purchasing decisions are most sensitive to price [46]. This phenomenon posits that individuals experiencing income shortages are keenly aware of and sensitive to the trade-offs of foregoing one item in order to purchase another [41, 53, 54]. Behavioral economics proposes that this occurs because resource scarcity "captures one's attention" and places economic decisions at the top of one's mind [55]. Mullainathan & Shafir (2013) also describe a fifth phenomenon, namely that individuals experiencing scarcity are also more likely to make decisions based on their own budgetary or *internal frames of reference* rather than external references, such as the purchase place or price marketing [41, 46]. This is important because internal references guide a person's sense of value [55]. In the context of HIV, their work proposes that individuals preoccupied by monetary scarcity may be less responsive to other contexts or "framing effects," such as HIV prevention messaging [55]. Lastly, according to a sixth phenomenon, when scarcity is replaced by excess or *slack* individuals are better able to exercise choice and make decisions that yield more positive outcomes [46]. In addition, consistent with traditional economics which predicts that a rational response to resource

scarcity involves more cautious behaviors, such as saving and decreased spending [56], experimental psychologists suggest that during intermittent periods of excess or slack, individuals with greater resources increase engagement in *risk-seeking behaviors* to compensate for perceived prior losses during scarce periods [57, 58].

This study aimed to understand how contexts of economic scarcity influence sexual risk behaviors among adolescents and young adults living in urban slums. Urban slums are informal settlements in metropolitan areas that are characterized by overcrowding and concentrated and severe economic deprivation [59]. Slum communities are widespread in low-income countries and typically lack basic urban infrastructure, such as roads, piped water, sanitation, and electricity [59]. Adolescents and young adults living in urban slums often lack established income-earning opportunities in an already high-poverty setting. In addition, although high quality data are limited, there is evidence that urban slums have higher HIV prevalence as compared to non-slum urban areas [60]. To our knowledge, no study to-date has applied these scarcity phenomena to investigating how persistent poverty influences sexual risk behaviors and ultimately HIV risk among the urban slum poor. While there are a number of papers highlighting the traditional economic drivers of risk behaviors (i.e., price of sex, income effects) [61–63], there is reason to believe that the growing field of behavioral economics might add important insights to understanding economically-motivated sexual behaviors. In particular, we chose a scarcity angle of behavioral economics given the severe resource restrictions faced in African urban slums. We thought this would be the best approach in describing the circumstances around HIV vulnerability in economically-disadvantaged youth because scarcity theory draws attention to the role of financial insecurity in altering how individuals and communities approach sexual decision-making. Therefore, we expected that scarcity theory would provide a more appropriate basis for investigating the links between poverty and HIV vulnerability. A scarcity lens may also assist next generation prevention strategies in addressing the behavioral economics of the epidemic in urban poor populations. Therefore, this study aimed to characterize youth's own perspectives on how economic scarcity contributed to sexual risk behaviors, defined as sex without a condom or sex outside of a person's union. Based on study findings, we then interpret the associations proposed by youth using a scarcity framework from traditional and behavioral economics.

Methods

Design and Setting

We used an interpretive phenomenological approach based on qualitative focus group discussions with adolescents and young adults living in two urban slums in Nairobi, Kenya. Interpretive phenomenology aims to understand insider meanings of persons who have experienced a particular phenomenon in relation to other social, cultural, and historical contexts of everyday life [64, 65]. We chose this methodology in order to characterize urban slum youth's experiences of managing HIV risk in the context of high HIV prevalence and economic deprivation. While interpretive phenomenological analyses are commonly conducted with individual interviews, using focus group discussions enabled us to obtain individual and shared experiential perspectives from urban slum youth as a group, and to

potentially generate more reflection based on experiences of others within the group [66]. An interpretive phenomenological approach is also suitable for qualitative analyses that are not designed for theoretical hypothesis testing.

The two urban slums included in the study were: Korogocho, the city's northeast urban slum, and Kawangware, the city's western urban slum. Two of the study's investigators had prior experience and research relationships in these settings. Similar to many informal settlements, these slums lack basic services and infrastructure such as electricity, durable housing, and access to clean water [67, 68]. The majority of urban slum residents rely on low-skilled work (i.e., domestic labor, casual jobs, petty trading) in response to high levels of unemployment and income instability [67, 68]. HIV is primarily transmitted heterosexually in Kenya [69]. According to the most recent Demographic and Health Survey (DHS), 6.3% of Kenyan adults, aged 15–49 years, are living with HIV with urban populations having higher HIV prevalence (7.2%) than rural populations (6.0%) [70]. The urban-rural difference persists in young people, aged 15 to 24, with HIV prevalence at 3.0 and 2.8%, respectively [70]. Kenyan youth within the lowest wealth quintile also have higher HIV prevalence (3.1%) compared to youth in the highest wealth quintile (2.6%) [70]. In addition, over half of Kenya's city dwellers live in urban slums with an HIV prevalence of 12% compared to 5% in non-slum urban areas [60, 68].

Participant Recruitment

Eligible participants included male and female adolescents, aged 15 to 17, and young adults, aged 18 to 22, who were living in Kawangware or Korogocho at the time of the study. We stratified participants by age to facilitate discussion ease among age-mates on sensitive topics related to HIV or sexual behaviors. We also stratified by gender to examine differences in scarcity and risk perspectives between male and female youth. Community representatives purposively selected potential participants by visiting individual households and describing the study. Interested participants and parents (for youth aged 15 to 17) were then invited to meet one of two Kenyan focus group moderators (a woman or a man) the following day at a designated community center within the urban slum. Upon arrival, the moderator described the study in-person and invited individuals to participate. As part of this process, written informed consent was obtained for all young adults aged 18 to 22. Parental written consent and child written assent were obtained for adolescents aged 15 to 17. There were no cases of non-participation. For purposes of this study, the term “youth” refers to both enrolled adolescents and young adults.

Data Collection

Data were collected in November and December 2014 using twenty focus group discussions. We stratified youth across four gender-age strata with four focus groups each: adolescent girls aged 15 – 17 years; adolescent boys aged 15 – 17 years; young women (adults) aged 18 – 22 years; and young men (adults) aged 18 – 22 years. These groups were preceded by one pilot focus group in each stratum, representing an additional four focus groups included in the analysis. A total of 20 focus groups were completed (i.e., ten focus groups in each of the two urban slums). In addition, each group was moderated by one of two gender-matched moderators who had prior experience in conducting qualitative research on sexual health in

Nairobi's urban slums. The moderators used a semi-structured discussion guide, which was developed by the research team and field-tested using the four pilot focus groups. All discussions were conducted privately, led in Kiswahili, and lasted about one to two and a half hours. Participating youth were informed of the reasons for doing the research and the moderator's background and interests. We then asked youth the following opening questions relative to their personal experience or that of urban slum peers: (i.) how would you describe your economic situation or that of youth in this settlement?; and (ii.) how has your economic situation or that of youth in this settlement contributed to HIV risk?; (iii.) how has your economic situation or that of youth in this settlement influenced one's capacity to prevent HIV?; and (iv.) how do you think changing your economic situation or that of youth in this settlement will change the way one protects themselves from HIV? Each enrolled participant contributed to a maximum of one focus group and was provided 250 Kenyan shillings for his or her time, the approximate equivalent to \$2.50 U.S. dollars. All discussions were digitally recorded, assessed for saturation, translated into English, and transcribed verbatim. A field supervisor checked the translation quality of a sample of transcripts by contrasting the Kiswahili to English and back.

Analysis

The analysis was completed in two phases with contributions from the first two authors and a supporting graduate research assistant. First, we manually conducted an initial open coding based on the first read of all transcripts. We started with line-by-line inductive coding of youth's own responses to identify common responses among youth independent of concepts proposed by scarcity theory. Following an initial open coding, we then developed a final list of codes based on the provisional code list used during the open coding. Codes were categorized into four economic domains based on the types of economic determinants described by youth. These were: (1) *economic resources*, such as references to cash, savings, income, or employment at the individual or household level; (2) *economic environments*, such as references to impoverished settings, local economies, or markets in or outside of the urban slum; (3) *economic costs*, relating to any mention of expenses, fees, prices, or financial gains and losses associated with preventing or treating HIV; and (4) *economic motivations*, relating to youth's descriptions of financial goals, incentives, or pursuits that linked to increased or decreased HIV vulnerability.

In the second phase of the analysis, we applied a second cycle of focused coding using NVivo (QSR International, Version 10.2.2) that allowed us to query all transcripts with the final code list and investigate more nuanced findings relating to HIV risk and scarcity by economic domain. During this phase, we also developed analytical notes based on traditional economics and the behavioral economics scarcity phenomena described by Mullainathan & Shafir (2013) [46]. Quotations were then extracted to illustrate common themes or responses among youth. To provide a sense of the predominance of some themes relative to others, we also documented the general number of times each one was discussed. In the results below, we present the emergent themes from youth for each economic domain, followed by a scarcity interpretation based on traditional and behavioral economics.

Ethics Approval

This study received ethics approval from the Johns Hopkins Bloomberg School of Public Health Institutional Review Board and the Kenyatta National Hospital, University of Nairobi Ethics and Research Review Committee. This manuscript complies with the consolidated criteria for reporting qualitative research (COREQ) and the standards for reporting qualitative research (SRQR), both item-based checklists for interviews and focus groups [71, 72].

Results

Participant characteristics and emergent themes

Twenty focus group discussions were conducted representing a total of 120 participating youths (Table 1). Half (50%, n=60) of youth were recruited from Korogocho, and the remaining half (50%, n=60) from Kawangware with equal numbers of adolescent girls and young women (n=60, 50%) and adolescent boys and young men (n=60, 50%). Most youth had completed only primary school (76%, n=91) and were unemployed (81%, n=97). Table 2 lists the emergent themes described by youth regarding the relationship between poverty and HIV vulnerability, along with scarcity interpretations from traditional economics and the psychology of scarcity from behavioral economics as laid out by Mullainathan and Shafir [46].

1. Economic resources

1.1 Increase ability to acquire sexual partners

One emergent theme described by youth was that economic resources increased one's ability, particularly that of male youth, to acquire sexual partners. When asked how having economic resources could lead to HIV acquisition, youth responded that having access to cash enabled young men to negotiate and offer sex in exchange for paying for young women's school fees, clothing, or other basic needs. Young men who lacked money were described as not being able to afford several sexual partners since they could not financially support multiple women and could not exchange money for sex.

“When you are poor how can you sustain three women? You can't. But if you have money, you will have all the affairs with women because you don't have money problems, yeah.”

– Kawangware, male, 18 – 22 years

“You know there are those on the side of the youth when they have a lot of money it makes them take advantage of girls. So it'll be like he is using them because he has a lot of money.”

– Kawangware, female, 15 – 17

“Ok. You find this [male] person who has money, and there is this girl who doesn't have money so it is like I want this girl. He tells her once you have sex with me, I will pay for you something like school fees. I will help you be ok.”

– Kawangware, female, 18 – 22

This finding is consistent with rational decision-making as explained by traditional economics in which young men acquire more sexual partners when more resources are available. However, the finding also corroborates with the scarcity concept in behavioral economics of increased risk-seeking in response to alleviated scarcity, as a greater psychological response to compensate for prior perceived monetary and sexual loss than is proposed by traditional economics. Young men reflected on the hardships of lacking cash, and relative to an internal reference point – the immediate tendency when accessing cash to make-up for sex opportunities lost that they had previously been unable to afford.

“When you have money, you know you get sex. Let’s just be honest. When you have money, that is when you get sex.”

– Kawangware, male, 18 – 22

“With how the economy is down, I cannot have a girl in the house ...because I cannot meet all those needs. ...So when you don’t have money, the day you get something small you go around tasting all over.”

– Kawangware, male, 18 – 22

1.2 Minimize adverse effects of acquiring HIV

In response to how having economic resources could lead to HIV acquisition, youth perceived that those with greater resources may be more likely to engage in sexual risk behaviors as a result of having money to reduce the negative outcomes of HIV infection. This possibility was described in the context of being able to pay for HIV treatment and being more financial capable of adhering to antiretroviral therapies and securing food sources for overall well-being.

“Most people risk because now they will see actually I have money. Even if I got that disease, I can cater for the medical expenses. If it is fruits – I can buy. So, I will just see I can do everything I want. It’s my life. I have money. I can get treatment. So if there is [money], he can [do as he wants]. So he risks.”

– Korogocho, female, 15 – 17

“Let’s say [there is] someone who has money and [someone] who doesn’t have money and both of them have AIDS. The person with money can keep himself well because these days there are people who have AIDS, but they are healthy. The one with money...will eat the foods that are required. He takes the ARVs. He eats well. Even when you see him like this, you cannot say that person has AIDS.”

– Kawangware, male, 15 – 17

Youth also suggested that while community resources available to support HIV care and treatment were limited in past years, the growing availability of non-governmental organizations (NGOs) in urban slums to treat and care for persons living with HIV reduced aversion to becoming infected. Traditional economics predicts both of these responses in the form of moral hazard, in which individuals have lowered incentive to guard against risks given the increased protection from the consequences of those risks [73, 74]. From a scarcity perspective, youth envisioned that a natural response to alleviated scarcity was uptake in behaviors with less relatively costly consequences.

“People are saying NGO’s have come so many. They are helping HIV people. So she sees if she gets sick, it’s like getting a flu.”

– Korogocho, female, 18 – 22

1.3 Increase ability to reduce number of sexual partners

The perceived relationship between economic resources and HIV acquisition was reversed for adolescent girls and young women. They indicated that having more economic resources reduced the number of “boyfriends” previously relied upon to accumulate sufficient income. Having more cash also enabled them to select a sexual partner or spouse with less regard for financial need.

“You will not have many boyfriends...because you will have enough money.”

– Kawangware, female, 18 – 22

“You know even girls when they have money, they feel good because there is nothing you don’t have. So there is no one who can ...play with your life. If you have money, you alone can decide when you will marry and stuff like that because you have everything.”

– Kawangware, female, 15 – 17

“The one thing about getting a lot of money that is good is [that] you will not go after men who have money. You will go to a man because you love him, not because of the money.”

– Kawangware, female, 18 – 22

This finding among adolescent girls and young women is consistent with the scarcity principle that when scarcity is replaced by excess or slack, individuals are better able to exercise choice and have more cognitive bandwidth to incorporate non-economic preferences, including consideration of less risky options, in their decisions. On the other hand, adolescent boys and young men were described as reducing number of sexual partners and therefore HIV risk only in contexts of resource scarcity.

“With the economy as it is for me I cannot support a family with how the economy is down... [But] when you have money you cannot get HIV because you keep only one wife.”

– Kawangware, male, 18 – 22

“I have lived with boys and better [are] those ones who don’t have money. They don’t risk you see, and those who have money risk you see. Because someone who has no money will only think of how to get for food.”

– Kawangware, male, 15 – 17

2. Economic environments

2.1 Limited low-risk employment options

Adolescent girls also indicated that their economic situation contributed to HIV risk due to the limited employment options within urban slums for adolescent girls which did not

expose them to the virus. Domestic jobs and familial obligations were provided as examples of cases in which adolescent girls found it difficult to refuse sex exchange opportunities or were at risk of forced sex.

“So a man comes and tells her ‘let us go to my house you wash clothes for me,’ so that washing of clothes was for him to do what...? So, there also, the person with no money to protect themselves will be [having it] hard.”

– Kawangware, female, 15 – 17

“You know there are those girls, let us say, in their family, they are not ok. You see your mum has no money ...So even if you do not want [to], you will have to force yourself to go and live with that boy. At least that money that you will be given, you will give [to] your mum a little to at least pay rent or get something to cook.”

– Kawangware, female, 15 – 17

“For example, I am [a] girl living alone. I have children, and I am not stable. So, you see, I am stressed. I have not paid rent. The children want to go to school. Then I meet with, for example, a sugar daddy and he has money and he has AIDS. So, if he tells me to go with him, and he gives me money, I will forget my stress because I have need for the money, and I go.”

– Kawangware, female, 15 – 17

While the absence of lower risk employment options reflects structural factors of the broader urban slum economy, many young women’s comments were consistent with the scarcity phenomena of tunneling, where young women prioritized financial needs over consideration of negative sexual outcomes. As one young woman noted below, these trade-offs between earning income and being exposed to HIV, for example, were accepted in urban slums given the lack of better employment options.

“Both men and women, there is no way to tell who, since they all want money. And if they see money, you don’t give a d*** what happens. All you want is the money, especially guys like us [referring gender-neutrally to urban slum youth] who have no way out.”

– Korogocho, female, 18 – 22

2.2 Financially-interdependent sexual networks

Young women also described the reliance on primary and/or extra union partners, often as “sugar mummy” and “sugar daddy” relationships, to acquire cash, goods, and other productive assets as contributing to the spread of HIV in urban slum settings. Youth living in urban slums often lacked access to credit and collateral income through formal financial institutions.

“The ones who are at a high risk of getting HIV are both of them because if we look at the neighborhood, it’s not just the girls who engage in prostitution. All people engage in it. You find that a guy gets a sugar mummy who gives him money, and he feels that that’s the only way out. ...And if a girl also finds that she has no money, ...she has to have sex so as to get the money.”

– Korogocho, female, 18 – 22

“Because first he wants money. Maybe the boy is a hustler, and maybe the woman will be like a sugar mummy. This boy wants money because his girlfriend also wants money. So you see, it is he [who] is given then he gives [to] his girlfriend, then it continues.”

– Kawangware, female, 18 – 22

“I have my sister. ...Her husband has a sugar mummy. That woman has bought him a house. She has bought him even a car. ...Now my sister lives like a queen. I even ask her, ‘That your husband? What if he brings you ---?’ And she asks me, ‘What, AIDS? ARVs are free.’ I am even surprised myself. ...She is okay with it. Even when the husband tells her, ‘I have been called’. She just tells him, ‘You run’.”

– Korogocho, female, 18 – 22

As posited likewise by tunneling effects of scarcity theory in behavioral economics, young women similarly perceived that couples’ preoccupation with financial survival (or “wanting money”) partially fueled these sexual networks with less consideration of future HIV consequences. This reinforces a traditional economics explanation in which the creation of informal access to cash and credit is a rational response to existing market options, which is exacerbated by the psychological effects of tunneling.

3. Economic costs

3.1 Female condom prices perceived to discourage use

There was a general perception among male and female youth that financial costs were not a barrier to use of male condoms which were reported as easy to acquire for free and carried by young men and women. In contrast, as a minor theme, young women and adolescent girls noted that female condoms and other female-controlled barrier methods were perceived as cost-prohibitive and dangerous for most urban slum women. This was indirectly attributed to the spread of HIV as cost barriers to using female condoms limited their ability to take an active and autonomous role in preventing sexually transmitted diseases.

“Boys use [male] condoms. Ladies will use...(pauses) – they will just use the same. Let me just say [the] same. The female one is expensive. You walk with the ones for boys. You know girls have taken those condoms for boys, [since condoms]...for girls are expensive and it is also risky when using it.”

– Kawangware, female, 18 – 22

“Between the male and the female condom which one is expensive? Female. For girls it is expensive because if you see what it’s made of. It’s not light like for the boys. That one [the female condom] is heavy. That is why it is expensive. ...I don’t know how much it cost, ...but when you go to buy at the chemist, [it’s] a lot of money.”

– Korogocho, female, 15 – 17

Traditional economics describes price sensitivity as a key determinant in purchasing decisions when resources are limited. Scarcity theory also proposes that individuals with insufficient resources have a heightened awareness of the costs (both real and perceived) given the financial impact of a single purchase.

3.2 Financial barriers to HIV testing

Youth were also keenly aware of monetary and opportunistic costs associated with HIV counseling and testing services, suggesting that these costs discouraged use. Local testing services which were advertised as free, in some settings, were described as still being infrequent and requiring out-of-pocket fees. Young men were also concerned about potential lost wages and lost time due to travel to and waiting at non-slum testing sites in an effort to maintain confidentiality.

“...You will find when you have money you can even go for guidance and counseling. ...You will find information that will help you because you will be told ...that AIDS is real.”

– Kawangware, male, 18 – 22

“You know if you don’t have money, there is no way you will go to waste your time there [at HIV testing site]. And there is a way if you stay in the neighborhood you can get some work, something small that will give you lunch. ...If you have money, you will go for the guiding and counseling...You will not have time to wait until those ones that are free to come.”

– Kawangware, male, 18 – 22

“Are you telling me you will go from Koch [*urban slum*] and maybe the nearest hospital is in Huruma [*non-slum*], and you want to know your status?”

Korogocho, male, 18 – 22

4. Economic motivations

4.1 Economic survival more important than avoiding HIV

The need to economically survive in urban slums was commonly portrayed as diverting one’s attention from protecting against HIV. Youth used the term, “sufferer”, for urban slum residents who struggled to make a living, which became their primary concern. Sufferers were described as less able to prioritize avoiding HIV over immediate financial needs.

“Yes, the sufferer has a higher risk of getting that stuff [*HIV*] because he is looking at how he will survive and wake up tomorrow. So he is desperate. So he will do anything to get that money, so he is more exposed and at risk.”

– Kawangware, Men, Aged 18 – 22

“She doesn’t care about AIDS. Her need is for money. So the people who are at a higher risk for contracting HIV/AIDS is those who don’t have money.”

– Korogocho, Women, Aged 18 – 22

In traditional economics, this is explained by financial constraints that limit optimal health behavior. Young women and men's responses also illustrate the bandwidth tax proposed by scarcity theory in which given the demands of meeting basic needs, poor youth are unable to focus on issues unrelated to economic survival or make informed decisions that account for non-economic priorities.

4.2 Long-term goals can inspire protective sexual behaviors

However, there was also a sentiment that having long-term financial pursuits, such as a small business, motivated young women and men to protect themselves and their families from HIV in order to benefit from those economic pursuits. For young men and adolescent boys in particular, long-term financial stability was depicted as protective of HIV since being financial stable encouraged men to invest in marriage or a single sexual partner.

“This one who does not control his life can get [HIV] because he is just there as long as he is alive. This other one knows what they want from their life, so he will protect himself. Because maybe there is something they want in future. So he must protect himself, so that he can get it.”

– Kawangware, female, 15 – 17

“Then they will see since I have been opened for a barbershop, let me abstain and keep my family ok.”

– Kawangware, female, 15 – 17

“There is one with a business but does not see the future. And, there is one with a business and sees the future. Now the one with the future will try to protect himself [from HIV] but this one without a future will just spill and get the disease.”

—Kawangware, male, 18 – 22

“Because he is financially stable he can think about things... He can dream of a car, and he has a family. So, he doesn't think about loving girls or use his money on girls. Maybe he can get a wife, so his money he takes to the house.”

— Korogocho, male, 15 – 17

Traditional economics proposes that increased resources prompt individuals' desires to realize more positive life expectations [75]. Increased certainty in employment or business capacity may also provide youth longer planning horizons (i.e., the length of time one prepares for the future) to protect against HIV and other adverse outcomes. Conversely, experiencing scarcity may shrink youth's planning horizons and lead to more myopic decision-making with less consideration of the consequences.

4.3 Transactional sex is a viable investment strategy

Lastly, although some youth disapprovingly referred to transactional sex as “prostitution”, others highlighted the favorable use of commercial sex as one of a series of steps to achieve financial autonomy. Income earned through sex was described as minimizing financial distress in order to focus on other life goals, such as education or employment – and only sometimes, but not always, resulting in HIV acquisition.

“Those people who get successful from prostitution are the ones who say, ‘I want to join this so that I can benefit.’ Such a person can practice prostitution for one year. Then when she gets capital to do something like a business, then you leave it. ... Two girls have done that. They now have good lives.”

– Korogocho, male, 18 – 22

“I don’t tell her because I want money. I just want money, so I can’t tell her. So I have sex with her, and she gives me money. [And], I see how I can plan my life.”

– Korogocho, male, 18 – 22

“She will say let me be a prostitute first. I get this money. I open that job. Once I open, I will stop. So, by the time she says she has reached that amount and she stops, she will maybe have already gotten [HIV].”

—Kawangware, female, 15 – 17

Using a scarcity lens, this response mirrors tendencies described by behavioral economics in which youth mentally account for gains from high- and low-risk strategies relative to an internal reference. In this case, the long-term profits from transactional sex were perceived as greater than costs associated with low and unlikely risks of HIV. Economically-motivated sex can also be interpreted using traditional economics in that youth opted to use one available source of income, including a risky source, to achieve wealth and higher economic status.

Discussion

The present study examined how economic scarcity influences sexual risk behaviors and ultimately HIV vulnerability among impoverished youth living in two urban slums in Kenya. To our knowledge, this is the first published study to-date to apply principles from traditional and behavioral economics, in particular the theory of scarcity as propagated by Mullainathan & Shafir (2013), in understanding the duality that impoverished youth face in making sexual decisions both in response to direct money shortages and under the cognitive load of financial distress. We found that youth living in urban slums made economically-motivated sexual decisions that would be considered rational from a traditional economics perspective, such as acquiring more sex when more resources were available, being price-sensitive to costs of condoms or HIV testing services, maximizing access to credit and income through sex, and taking more risks when having the financial means to better protect from adverse sexual consequences.

However, youth’s engagement in sexual risk behaviors was also motivated by scarcity phenomena explained by behavioral economics, such as being encumbered by financial worries that dominated concerns for HIV infection (*tunneling*, *bandwidth tax*), compensating sex lost during scarce periods (*risk-seeking*), and transacting sex as an investment strategy (*internal referencing*). In addition, the relationship between scarcity and HIV vulnerability sometimes varied by gender. For young women, once scarcity was alleviated, young women described reducing the number of sex partners to account for non-economic preferences (*slack*). In contrast, we found that while resource scarcity was thought

to lower HIV risk in young men by reducing access to sexual partners, long-term financial stability was perceived as protective by promoting partner loyalty in young men through monogamous or married sexual partnerships. Likewise, for male and female youth, focusing on positive financial goals was described as motivating protective sex. While several behavioral economics explanations were similar to those explained by traditional economics, some more nuanced effects among male youth, such as “catching up” for sex after a dry spell that may be caused by a perceived loss relative to a previous reference point may lead to a stronger reaction than explained by traditional economics. These findings imply that combination prevention interventions, including biomedical technologies relying on adherence, should not ignore traditional and behavioral economic drivers of sexual decisions among individuals, couples, and sexual networks [43].

Past studies have yielded similar findings as observed in this study in which economic factors were observed to play a crucial role in the sexual decision-making of people living resource-poor environments. For example, in Uganda, Kenya, and Lesotho, studies have shown that young women increased supply of sex to acquire luxury goods, such as mobile phones and high-priced clothing [10, 29], but had greater choice whether to use a condom or engage in sex or not when earning salary through employment [76]. In Nigeria, a study also found that attempts to mitigate food deprivation partly explained slum adolescent girls’ engaging in risky sexual behaviors [77]. The observation that men have more non-sexual opportunities to earn income has been documented in Mozambique and Haiti [28, 78], and was also described among our youth in Kenya. There has been some evidence as well suggesting that young men in Lesotho increased demand for sex partners once obtaining employment or income [76], and that economic hardship for Zimbabwean men diminished their capacity to support sexual relationships [79]. Research has also shown that while cost barriers persist in accessing discounted and free male condoms among low-wage users [21, 80], the cost of female condoms is approximately twelve times greater than male ones and often unaffordable for low-income consumers who find them acceptable to use [81]. Interestingly, a study in Nigeria observed that earning an income was marginally associated, but not statistically significant, with higher odds of male condom use among both slum adolescent boys and girls [82].

Findings from this analysis point to three implications for HIV prevention in resource-poor settings. One implication is that developing gender-specific strategies that integrate traditional and behavioral economics into combined prevention technologies may better enable urban poor youth to reduce HIV risk. There has been increasing recognition of the inadequate programmatic response to the role of economic context on HIV risk in urban poor settings [83, 84]. From a traditional economics perspective, this means recognizing that both male and female youth are “rational” in maximizing their wealth and may be more likely to adopt preventive technologies when conflicting financial goals are less prominent. For example, for girls and young women, in addition to expanding safe employment options, HIV messaging with economic assets or investments that are conditioned on preventive behaviors rather than unprotected sex exchange may be more effective in reducing risk by affirming young women’s financial goals. Developing safe and lower-cost female condoms may also prove beneficial. For boys and young men, as prevention technologies are marketed at-scale, integrating HIV testing and risk-reduction counseling with increased

anonymity in venues frequented by men may reduce concerns regarding lost wages and counter risk-seeking sexual behaviors. “Going out” to parties and “getting girls” was a normative desire among young men which they pursued when resources allowed. Therefore, coupling HIV prevention programs with male-focused savings, goal-setting, and commitment incentives may offer alternative pursuits or more protective goals during non-scarce periods. A technology-based intervention might also be used to divert scarcity-prompted sexual risks by assisting youth to make judgments based on key costs and benefits, especially during scarcity periods when they are most prone to engage in sexual risk-taking. For example, text-based messages may include purchasing condoms or pre-exposure prophylaxis before “getting girls”, accessing a jobs-hotline for earning fast, but low-risk income, or investing additional monies towards buying a productive asset rather than increasing HIV risk.

Secondly, recognizing the material and psychological effects of financial scarcity, we suggest that economic development among urban poor youth should be considered for improving health behavior and health outcomes, including HIV. Our findings indicated that youth’s financial worries were at the fore of their decisions regarding sexual relationships and other life choices, a phenomenon described by scarcity theory where one’s mind is “captured by unfulfilled needs” [40, 46]. In scarcity contexts, youth are unlikely to prioritize long-term health goals such as avoiding HIV over short-term survival needs – a rational economic response that can be further aggravated by present bias. In fact, research has shown that poor health outcomes among slum residents, including slum youth, is driven in part by an inability to reallocate at the time of need financial resources reserved for daily living (i.e., food, shelter) towards payment for treatment and preventive services [85]. In addition, the necessary and inevitable transition of HIV to a treatable sexually-transmitted infection and the associated perceived reduction in costs will likely continue to shift how youth balance trade-offs and rewards of sexual risk behaviors. Therefore, interventions which concurrently address not only the biomedical, but also the economic and structural determinants of HIV are urgently needed.

There is also the quandary that the alleviation of financial strain may increase HIV risk in terms of seeking additional sex partners and reduced perceived cost of an HIV infection due to money to treat post-infection and increasing access to community-based care. This may seem counterintuitive, but is consistent with traditional economic theory. Research has shown that when presented with higher perceptions of and access to curative options, individuals may be more inclined to take risks or have reduced incentive to take preventive measures [86]. For HIV prevention, this means efforts are needed to counter normative economic responses that may increase risk, and make more salient the protective qualities of increased and stable income for young women and young men. Urban poor youth may be more inclined to utilize HIV preventive biomedical tools, including male and female condoms, pre-exposure prophylaxis (PrEP), and microbicides, if these initiatives are perceived as part of youth’s short- and long-term economic interests. Conversely, youth in this study also noted that pursuing long-term financial goals motivated protective desires to avoid HIV in order to realize their gains in the future. Although long-term economic opportunities were perceived as less accessible, they were especially valued among male youth who described the negative impact of fast and often fleeting earnings. Such findings

corroborate economic studies suggesting that increased economic resources leads to more positive life expectancies, which, in turn, results in stronger incentives to reduce risk and invest in health protective activities that will expand an individual's time to accrue returns on their investments [75].

Finally, a third implication relates to noting that HIV rates are lower in Kenya among the rural poor as compared to the urban poor [60, 68, 70], which suggests that economic scarcity alone is not the sole driver of HIV vulnerability. However, urban residents may perceive similar levels of resource scarcity differently than the rural poor given their proximity to urban amenities and wealthier urban residents which are less prominent in rural settings. The theory of scarcity is based in part on perceived scarcity that individuals experience relative to what they consider to be sufficient, which may also be greater among urban compared to rural poor. Research has shown that exposure to resource scarcity cues matters as a trigger for the "scarcity-mindset" and its psychological effects [40, 58]. Such cues for the urban poor may be exclusion from formal employment opportunities and financial institutions as well as lacking piped water or other amenities observed in urban settings. The proximity of greater numbers of sex partners, as well as increased mobility and higher exposure risk due to higher HIV prevalence in urban settings may likewise exacerbate the influence of scarcity on the epidemic [60, 67]. More efforts are needed to develop strategies that address HIV risk through economic empowerment and inclusion.

Limitations and strengths

This study was limited by the following attributes. We did not distinguish poor and non-poor urban slum residents, as there may have been differences among youth who were chronically poor versus those who were temporarily budget constrained. Rather, economic scarcity was established by residence in an urban slum and analyzed at the group level given that, by definition, urban slum residents lack one or more conditions for infrastructural and economic security [87]. However, future qualitative research may be strengthened by stratifying young people according to economic circumstance to examine the how the presence of scarcity influences sexual behaviors. We also did not distinguish between exchange and non-exchange sexual partnerships which may or may not have involved condom use. Therefore, this study was unable to tease apart effects of scarcity on specific types of sexual risk behaviors. Given the qualitative design, we were also unable to empirically test or distinguish between a traditional versus behavioral economics explanation of the phenomena reported by youth. While the study dually examined sexual decisions in response to economic contexts that both optimized benefit and that failed to optimize an individual's best interests, we did not explore all factors influencing to sexual decisions.

Other limitations were that the range of scarcity concepts included in the analysis may have detracted from a more in-depth inquiry, in addition to being closely related and having multiple potential causal explanations. Some of the proposed scarcity theories, while attractive, have also not been tested using empirical models and may have led participants to focus more on negative sexual outcomes rather than positive, protective behaviors. However, given the exploratory nature of the study, our goal was to capture the wide array of youth's

views which this analysis achieves. Further research on specific forms of scarcity and specific forms of asset development (wealth) and its relation to both risky and protective sexual behaviors would deepen our understanding. In addition, while we encouraged youth to share examples from their personal experience and from experiences of similar youth in the urban slum, some responses may have over-represented general views with less attention to individual experience. We also cannot rule out the possibility that youth overemphasized the impact of poverty on HIV as part of a tunneling effect or in response to the study questions asked. Inclusion of only one discussion per youth additionally limited youth's ability to provide feedback on our findings. However, the strengths of this paper are that it represents a conceptually-driven qualitative analysis in its examination of multiple economic domains. The study also used a robust sample of male and female youth in an African setting of the HIV epidemic. The application of traditional and behavioral economics to the interpretation of the youth's responses is additionally novel and a strength of the study.

Conclusion

Impoverished urban slum youth have disproportionately high rates of HIV compared to rural and non-slum urban youth. Yet, few studies have examined youth's perceptions of the economic drivers of HIV risk based on a scarcity theoretical framework. Given that youth living in urban slums made many sexual decisions that reflect material and psychological consequences of money shortages, next generation prevention strategies should address the behavioral economics of the HIV epidemic.

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Table 1

Sample size and demographic characteristics

	Urban slum		Total
N (%)	Korogocho	Kawangware	
<i>Sample Size</i>			
Number of focus groups	10	10	20
Number of participants	60	60	120
<i>Demographic Characteristics</i>			
Age (in years)			
15 – 17	30 (50%)	30 (50%)	60 (50%)
18 – 22	30 (50%)	30 (50%)	60 (50%)
Gender			
Male	30 (50%)	30 (50%)	60 (50%)
Female	30 (50%)	30 (50%)	60 (50%)
Education			
Primary school completed	47 (78%)	44 (73%)	91 (76%)
Secondary school completed	13 (22%)	16 (27%)	29 (24%)
Employment			
Full/part-time, formal sector	3 (5%)	2 (3%)	5 (4%)
Full/part-time, informal sector	2 (3%)	4 (7%)	6 (5%)
Unemployed	55 (92%)	42 (70%)	97 (81%)
Not reported/missing	0 (0%)	12 (20%)	12 (10%)

Table 2

Summary of focus groups' emergent themes with overlying scarcity theory and traditional economics interpretation

Economic domain	Relative frequency of discussion	Emergent themes based on youth's responses	Scarcity theory interpretation	Traditional economics interpretation
Resources	***	1. Greater economic resources increase ability to acquire sexual partners	Risk-seeking to reimburse sex lost during scarcity	Increased consumption in response to more wealth
	***	2. Greater economic resources minimize adverse effects of acquiring HIV	Less costs of consequences when scarcity is removed	Moral hazard given protection from negative consequences
	**	3. Greater economic resources increase ability to reduce number of sexual partners	Enabling slack provides choice and allows less risky judgments based on non-economic preferences	----
Environment	***	1. Impoverished communities offer few low-risk employment options	Limited access to income and credit exacerbated by tunneled financial priority	Wage-earning based on market options
	****	2. Urban slums include financially-interdependent sexual networks		
Costs	*	1. Female condom prices perceived to discourage use	Heightened concern of direct and opportunity costs	Budgetary limits increase price sensitivity
	**	2. Financial barriers to HIV testing		
Motivations	**	1. Economic survival considered as more important than avoiding HIV	Bandwidth tax limits attention to non-economic concerns	Financial constraints limit optimal behavior
	**	2. Long-term financial goals can inspire protective sexual behaviors	Reduction in myopic decision-making	Increased resources prompt desire to realize more positive life expectations
	*	3. Transactional sex is a viable investment strategy	Mental accounting of pay-off based on internal references	Maximizing wealth and other economic interests

[a] Relative frequency of responses are denoted by:

* discussed 10 times;

** discussed 11 – 20 times;

*** discussed 21 – 30 times;