



Perspective Paper

Social Policy

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RethinkHIV: The Project

2011 marks the 30-year anniversary since the Centers for Disease Control and Prevention introduced the world to the disease that became known as AIDS. Despite 30 years of increasing knowledge about transmission, prevention, and treatment, and current annual spending of \$15 billion, every day around 7,000 people are infected with the HIV virus and two million die each year. The HIV/AIDS epidemic has had its most profound impact in sub-Saharan Africa, which accounts for 70 percent of new worldwide infections and 70 percent of HIV-related deaths, 1.8 million new infections in children each year, and has 14 million AIDS orphans.

Humanitarian organizations warn that the fight against HIV/AIDS has slowed, amid a funding shortfall and donor fatigue. Yet HIV is still the biggest killer of women of reproductive age in the world, and of men aged 15-59 in sub-Saharan Africa. Time is ripe for a reassessment of current policy and expenditure.

The Rush Foundation has asked the Copenhagen Consensus Center to commission a group of leading health academics to analyze HIV policy choices and identify the most effective ways to tackle the pandemic across sub-Saharan Africa.

RethinkHIV identifies effective interventions in the fight against HIV/AIDS across sub-Saharan Africa. It applies cost-benefit analysis to highlight investments and actions that can make a significant difference.

The Copenhagen Consensus Center has commissioned eighteen research papers by teams of top health economists, epidemiologists, and demographers who examine the cost-effectiveness of a range of responses to HIV/AIDS in sub-Saharan Africa under the following topics:

- Efforts to Prevent Sexual Transmission
- Efforts to Prevent Non-Sexual Transmission
- Treatment and Initiatives to Reduce the Impact of the HIV/AIDS Epidemic
- Research and Development Efforts
- Social Policy Levers
- Initiatives to Strengthen Health Systems

A panel of five eminent economists, including recipients of the Nobel Prize, convenes in the fall of 2011 to carefully consider the research and engage with the authors. The Expert Panel is tasked with answering the question:

If we successfully raised an additional US\$10 billion over the next 5 years to combat HIV/AIDS in sub-Saharan Africa, how could it best be spent?

After deliberating in a closed-door meeting, the Nobel Laureate Expert Panel provides their answer, highlighting investments and actions that could be most effective avenues for additional funding. Their findings and reasoning are released in the fall of 2011, and published in full alongside all of the research in a collated volume in 2012.

RethinkHIV will generate global discussion regarding responses to HIV/AIDS in sub-Saharan Africa. To participate in a dialogue on the research and findings within sub-Saharan Africa, a Civil Society Conference and forums for youth are held following the Expert Panel meeting in late 2011.

The Civil Society Conference is a means of creating a dialogue with African civil society and to agree on a set of bold new actionable priorities with society politicians, civil society organizations, influential thought-leaders, and others within sub-Saharan Africa.

It is hoped that the project will motivate donors to direct more money to the investments and actions that are demonstrated to be most effective to curtail the pandemic in sub-Saharan Africa.

All of the research papers, and many different perspectives on priorities can be found online at the project's website:

www.rethinkhiv.com

You are invited to join the dialogue and provide your own perspective on priorities for action in Africa.

The Copenhagen Consensus Center

The Copenhagen Consensus Center is a Danish state-funded think-tank that commissions and promotes research highlighting the most effective responses to global challenges. The Center is led by author Bjorn Lomborg, named 'one of the 100 Top Global Thinkers' by Foreign Policy in 2010, 'one of the world's 75 most influential people of the 21st century' by Esquire in 2008, and 'one of the 50 people who could save the planet' by the Guardian in 2008. The Copenhagen Consensus Center is implementing the project, which follows the format of past projects such as Copenhagen Consensus 2004, Consulta de San José in 2007, Copenhagen Consensus 2008, and Copenhagen Consensus on Climate in 2009.

www.copenhagenconsensus.com

The Rush Foundation

The Rush Foundation, based in Lausanne, is dedicated to providing fast, effective funding for innovative thinking addressing the HIV/AIDS epidemic in sub-Saharan Africa. The Rush Foundation is the sponsor of the project. The Rush Foundation was launched in 2010 to fund sustainable projects in sub-Saharan Africa focused on alleviating the pandemic through innovative thinking, and to shake up the status quo in HIV thinking by spearheading thought leadership projects and debates that will help reframe HIV policy. Among other initiatives, the Rush Foundation is currently designing a grant programme with ActionAid in Africa aimed at generating new, sustainable HIV initiatives on the ground.

www.rushfoundation.org

The Papers

The body of research for RethinkHIV comprises 18 research papers. The series of papers is divided into Assessment Papers and Perspective Papers. Each Assessment Paper outlines the costs and benefits of at least three of the most promising responses, interventions, or investments to HIV/AIDS in Sub-Saharan Africa within the respective category. Each Perspective Paper reviews the assumptions and analyses made within the Assessment Paper. In this way, a range of informed perspectives are provided on the topic.

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Introduction

In the assessment paper, Vassall, Remme and Watts (VRW) present cost benefit analyses of four interventions aimed at enhancing the response to HIV/AIDS in sub-Saharan Africa (SSA). The interventions they identified are: i) cash transfers to keep girls in secondary schools, ii) increasing alcohol taxation, iii) adding gender training to existing microfinance and livelihood programs, and iv) community mobilization. They identified these solutions based on a detailed review of the literature and on consultations with HIV experts.

VRW selected these four interventions based on their assessment of the empirical literature which points to several structural interventions that have the potential to mitigate some of the structural HIV risks through economic empowerment, social protection, financial incentives and transformative processes. VRW stress that evidence on the effectiveness of these interventions on HIV prevention is limited, presumably because HIV prevention per se is not often the primary objective for many of these intervention.

The authors show that the benefit-cost ratios they obtained are sensitive to critical assumptions related to the net benefits of each intervention, the discount rate, and the costs of the interventions. Under the assumptions that VRW make, the benefit-cost ratios for these interventions are quite large, hence justifying public investments. Gender training has the highest benefit-cost ratio, followed by conditional cash transfers to keep girls in school, increasing alcohol taxation, and community mobilization. Overall the interventions considered are promising. Cost effectiveness and benefit-cost ratios, however, vary greatly across countries presumably because epidemiological and socio-economic factors are country-specific.

The assessment paper by VRW is selective in the choice of the interventions considered. The analysis is very well executed and the exposition is clear. Their selection of four interventions is largely justified based on the existing evidence. In this perspective paper, I use the assessment paper as a starting point to propose a discussion of the findings and offer further perspectives on the topic, on the basis of existing studies.

This perspective paper will start by discussing the issues policy makers are likely to be confronted with when they attempt to scale-up promising pilot studies. Next, it will argue that cost-effectiveness calculations should better integrate how unit costs are likely to vary when pilot studies are scaled-up. It will argue in particular that varying average costs will determine in part the size of the full scale project. Further, it will discuss some implications of increasing alcohol taxation that are not sufficiently addressed in the assessment paper. Finally, it will propose a possible intervention—offering life insurance to adults to stay HIV free. Calibration exercises by Araujo and Murray (2010) suggest that this intervention can reduce HIV transmission significantly, but randomized control trials would provide more credible evidence.

From pilots to scaled-up interventions

Three of the interventions reviewed in this assessment paper were based on pilot studies and/or controlled randomized trials. Since the RethinkHIV Project is aiming at identifying the most promising prevention interventions, two issues would need to be addressed. First, it is important to stress the difference between efficacy and efficiency studies. In particular, interventions which have demonstrated impact under closely managed conditions may not necessarily be as successful

under normal conditions. Second, the cost structure could change when moving from a pilot to a scale up, and therefore modifying the cost benefit ratios.

External validity

The first concern is related to the external validity of pilot studies. In other words, will a promising randomized control trial produce the same outcome in a different context? Are there any steps that can be taken to insure that results obtained at a pilot stage can be replicated either at a larger scale or in different settings? One way to overcome this critique has been to repeat similar experiments in different contexts. The rationale is that by testing hypotheses in different places, with enough contextual variety, we can confidently state that a theory holds and therefore can be used to inform policy decisions in other places. For instance, the effects of conditional cash transfers on education and child health have been replicated in many contexts (e.g. Baird et al, 2011, Fiszbein and Schady, 2009, Gertler, 2004, Paxson and Schady, 2008). As result, a consensus has formed on the effectiveness of conditional cash transfers at improving educational and health outcomes. Their effects on sexual behavior, however, are still less researched. Therefore, it is hard to argue that the results observed in one location in Malawi will hold in different contexts. For example, Baird et al. (2010) stress that their sample is representative of never married adolescent girls in Southern Africa, a region with high HIV/AIDS prevalence rate² compared to-let say- West Africa. It is not clear whether the estimated impacts will remain the same if regions with lower HIV prevalence rate were considered.

It is notable that three of the four interventions considered have another purpose in addition to HIV/AIDS prevention. Let consider the conditional cash transfers intervention, for example. It was intended also to keep girls in school. It is not clear whether education or HIV prevention was the primary purpose, or these two important development goals received an equal weight. The participatory gender intervention was piggybacked to microfinance program. Finally, governments maybe pursue different objectives with alcohol taxation, including increasing tax revenues. Obviously, this underscores the need for a multi-sectoral approach of HIV/ADS prevention programs.

This type of approach raises the question, however, how pilot studies can be replicated. In particular, understanding how different elements of the intervention work could provide useful insights when assessing the cost-effectiveness of alternative interventions. For example, the study considered has demonstrated that conditional cash transfers for keeping girls in school reduce HIV/AIDS transmission. The reduction of HIV/AIDS transmission could have operated through two channels. First, when girls' income increases, they are less likely to engage in transactional sexual intercourse with older men thereby reducing intergenerational HIV transmission. Second, as argued by Baird et al. (2010), it is the desire to stay in school that leads to reduced sexual activity and hence reduced HIV transmission.

If decreased sexual activity is driven essentially by income, then any cash transfers could be as good as well. In fact, unconditional cash transfers, if they are less costly to administer, maybe more cost effective than conditional cash transfers. Social safety nets could also be as effective in reducing HIV transmission. If, on the other hand, the observed impact is driven by girls' desire to stay in school, any policy that increase girls' marginal benefits to attend school (everything else being constant), would be as just as effective. Disentangling the underlying mechanisms which drive the impact can help decide among alternative interventions.

² It is estimated that about 24.6 percent of women aged 15 to 49 are HIV positive in the study area (Baird et al, p.58)

Varying average costs

Basic micro-economic theory suggests that average cost curve is U-shaped. Under ordinary circumstances, the average cost curve slopes downward, flattens out and eventually turns up. While the concept of diseconomies of scale easily relates to the theory of the firm, the causes of scale diseconomies also affect public interventions such as the ones discussed in the assessment paper (Marseille et al, 2007, Over, 1986). For instance, increasing costs of communication, bureaucratic inertia, and duplication of effort could contribute to increasing costs. Some inputs may become more costly as well. In the short run, an intervention may exhaust the available supply of lower-wage but adequately trained staff in the area. The intervention may be forced then to hire staff that is more expensive or less well trained and this would translate actually into increase in average costs. It is apparent that successfully scaling-up pilot interventions would require information concerning the threshold beyond which average costs increase (Over, 1986).

VRW assume constant unit costs when calculating the benefit cost ratios. The unit costs for of the interventions analyzed by VRW vary by a factor of 1.12 (for alcohol taxation) to 46.47 for (community mobilization). In addition to differences between countries (and possibly between different sites within countries), such variations may reflect differences in economies of scale as well (Preya and Pink, 2006).

When conducting sensitivity analysis, it would be informative to allow unit costs to vary with the size of the intervention. A more formalized approach which utilizes regression analysis can also be considered if the number of experiments is large enough. With enough observations on experiments, one could estimate a regression which relates program unit costs to program size (e.g. Marseille et al., 2007, Guinness et al., 2005). Even if crude, these estimates could provide useful information on how to project the costs of full scale program from the costs of pilot studies.

How big should an intervention be? Conditional on identifying a promising pilot and deciding to scale-up, policy makers would eventually have to decide on the size of full scale project. Let say the objective is to maximize the reduction of HIV transmission among poor girls in Malawi. Given a fixed budget should the full scale project target all girls who are below the poverty line, or would the objective be maximized by spending the available budget on a portfolio of interventions, for example?

Brandeau and Zaric (2009) propose using an economic framework to address these types of questions. The authors propose a model which has two main building blocks. The first part of the model uses a production function which captures the relationship between expenditure in prevention and the HIV sufficient contact rate. The second part of the model uses an epidemic model to describe the impact of changes in the sufficient contact rate on the spread of HIV. Instead of using simulation methods as in previous studies, Brandeau and Zaric use an economic framework that employs the concepts of cost-effectiveness analysis in order to determine the optimal level of expenditure, i.e. the level of expenditures that equalize marginal costs to marginal benefits. They identify two special cases: i) spend the entire budget on a given intervention if the marginal benefits are always greater than the marginal costs, and ii) spend nothing if marginal costs always exceed marginal benefits. Brandeau and Zaric further assume that alternative HIV prevention programs exist so that funds not invested in the given HIV prevention program can be used to fund alternative programs. As more pilot studies become available, this type of studies have the potential of helping policy makers allocate their limited resources more efficiently.

Alcohol taxation

VRW motivate this intervention by arguing that alcohol drinkers are more likely to be infected by HIV than non-alcohol drinkers (Fisher et al., 2007). Let accept that drinking alcohol increases risky sexual behaviors and HIV transmission. Following Chisholm et al (2004), VRW estimate that a 25 percent increase in alcohol taxation will result in 8.1 percent reduction in hazardous alcohol consumption, accounting for 10 percent increase in unrecorded consumption. VRW re-estate Chisholm et al (2004)'s argument that the hypothesized reduction in hazardous alcohol consumption will hold as long as unrecorded alcohol is between 5 percent and 50 percent. Countries in WHO's Africa sub-region E are in this category.

Estimates of price elasticity for alcohol in Africa are hard to come by. However, for Tanzania (which is part of the WHO's Africa sub-region E), Osoro, Mpango and Mwinyimvua (2001) estimated an own-price elasticity of -0.3 for a local market beer³. The authors also found a relatively high cross price elasticity of demand, 2.7, between Tanzania's local brew chibuki and market beer⁴. Based on these estimates, if the price of beer increases by 1 percent, the demand for beer will decrease by 0.3 percent and the demand for the local chibuki will increase by 2.7 percent. If the 25 percent tax increase were entirely passed onto the price of market beer (for example), then beer consumption would decrease by 7.5 percent while the consumption of the local chibuki would increase by 67.5 percent. Depending on the actual alcohol content of the local unrecorded beverage, hazardous drinking might not decrease. If there are substantial health hazards associated with unrecorded alcoholic beverages, then raising tax on "legal" alcoholic beverages such as beer could impose non-negligible costs in terms of public health⁵.

It is undeniable that alcohol taxation could potentially reduce HIV transmission. Whether taxing alcohol actually ends up reducing hazardous drinking (and thereby HIV transmission) will require thoroughly understanding of the local demand for alcoholic beverages. In particular, the prevalent own price elasticity of "taxable" alcoholic beverages, and the elasticity of substitution between "taxable" alcoholic beverages and potential substitutes, especially home brewed and/or smuggled alcohols that carry other health risks. Fortunately, microeconomic surveys with detailed consumption data are becoming increasingly available in Africa. The availability of these types of data makes the estimation of more elaborated demand systems possible and even a low-cost exercise. The potential role that alcohol taxation could have on reducing HIV transmission suggests that it is worth investing the necessary efforts to uncover robust estimates of elasticities.

The authors use aggregate time series data, and estimate one equation at the time.

Incentivizing adults

A well established fact is that hetero sexual intercourse is the dominant mode of HIV transmission in sub-Saharan Africa. The Global HIV/AIDS Program (2008) provides a summary of the pathways of HIV transmission in the sub-Saharan African context. In many instances, female sex workers (FSW) form the dominant core group in sub-Saharan Africa. Male clients of FSWs form the bridge between sex workers and the general population.

³ Note that WRV assume a price elasticity of -0.3 to estimate the dead weight loss associated with the tax increase.

⁴ The authors use aggregate time series data, and estimate one equation at the time.

⁵ Although rigorous analyses are rare, there are numerous anecdotes on the consequences of adulterated alcoholic beverages across sub-Saharan Africa. Deaths attributed to adulterated alcohol have been reported in Cote d'Ivoire (<http://www.panapress.com/19-die-from-adulterated-alcohol-in-Cote-d-ivoire--13-447060-17-lang2-index.html>), or in Uganda (<http://www.news24.com/Africa/News/Uganda-Illegal-alcohol-kills-30-20100408>) for example.

Given these pathways of HIV transmission, analysts and decision makers should be specific about which group(s) they want to target. For example, conditional cash transfers for keeping girls in school aimed at reducing the number of sexual contacts between adolescent girls and older adult males, among whom HIV prevalence rate might be high. A complementary approach would be to target older adult males directly, incentivizing them to remain HIV free. For example, a randomized control trial in Tanzania uses conditional cash transfers in Tanzania to remain free of sexually transmitted infection and HIV (de Walque et al, 2010). The pilot requires that participants be screened periodically for STI which serve as proxy for risky sexual behavior.

Recently, Araujo and Murray (2010) have proposed using a life insurance scheme to incentivize adult males to stay HIV free. In their model, agents can collect the life insurance benefits if their death is not the result of AIDS. They argue that excessive risky behavior results from low life expectancy and low levels of income, and illustrate the conditions for which the life insurance benefit can replicate the effects of higher income and life expectancy, thereby deterring risky sexual behavior and reducing the spread of HIV/AIDS. The life insurance policy can be made available to female sex workers as well. There is some evidence that some sexual workers are willing to engage in risky sexual intercourse with clients who are willing to pay more for to avoid using condoms (e.g. Gertler et al, 2005, Rao et al, 2003). This type of life insurance contract can provide enough incentives to sexual workers to take the test and if they are HIV negative to abstain from risky sex.

Araujo and Murray use calibration techniques to explore the model implications for Zambia, Kenya, Tanzania, Ethiopia, and Rwanda. With a life insurance of \$20,000, the annual costs per person range from range from \$19.81 for Kenya to \$38.40 for Zambia. Their results suggest a reduction in HIV prevalence by 6.4 percent in Kenya to 24.4 percent in Ethiopia. Although the simulated results appear promising, randomized control trials could provide more credible evidence.

Conclusion

Building on the assessment paper, this paper offers further perspectives on the potential challenges that policy makers are likely to be confronted with when they desire to scale-up promising pilot studies. The perspective paper stresses the need for providing policy makers with the tools and the information to move from promising pilot studies to full scale projects. It also argues that cost-effectiveness calculations should better integrate changes in average costs that are likely to occur when going from a pilot study to full scale project. Furthermore, it recommends devoting more efforts to understanding the underlying mechanisms that explain how specific interventions work. Finally, it proposes offering life insurance to adult individuals to stay HIV free as a mean for reducing risky sexual behavior and hence HIV transmission. Calibration exercises have suggested promising results, but randomized control trials would provide more credible evidence on the effectiveness of this policy.

References

- Baird, S., C. McIntosh, and B. Özler. 2011. "Cash or Condition? Evidence from a Cash Transfer Experiment." *Quarterly Journal of Economics*, forthcoming.
- Baird, S., C. McIntosh, and B. Özler. 2010. "The short-term impacts of a schooling conditional cash transfer program on the sexual behavior of young women." *Health economics*, 19 Suppl: 55-68
- Brandeau, M. L. and G. S. Zaric. 2009. "Optimal investment in HIV prevention programs: more is not always better." *Health Care Management Science*. 12:27-37
- de Araujo, P. and J. Murray. 2010. "A life insurance deterrent to risky behavior in Africa." Processed. Department of Economics, University of Wisconsin - La Crosse
- de Walque, D., et al. 2010. "Incentivizing safe sex: A randomized trial of conditional cash transfers (CCTs) for HIV/STI prevention in rural Tanzania".
- Fisher, J. C., H. Bang, H. and S. H. Kapiga. 2007. "The association between hiv infection and alcohol use: A systematic review and meta-analysis of african studies." *Sexually Transmitted Diseases*, 34: 856 - 863.
- Fiszbein A. and N. Schady 2009. *Conditional Cash Transfers: Reducing Present and Future Poverty*. World Bank Policy Research Report. World Bank: Washington, DC
- Galarraga, O. M. A. Colchero, R. Wamai and S. Bertozzi. 2009. HIV prevention cost-effectiveness: A systematic review. *BMC Public Health* 9(Suppl 1): S5. 1186/ 1471-2458-9-S1-S5.
- Gertler, Paul 2004. "Do Conditional Cash Transfers Improve Child Health? Evidence from Progres's Control Randomized Experiment" *American Economic Review*, 94(2), 332-341.
- Gertler P, Shah M, Bertozzi SM (2005). Risky Business. The Market for Unprotected Sex. *Journal of Political Economy* 113:518-550.
- Guinness L, L. Kumaranayake, B. Rajaraman, G. Sankaranarayanan, G. Vannela, P. Raghupathi and A. George. 2005. "Does scale matter? The costs of HIV-prevention interventions for commercial sex workers in India." *Bulletin of the World Health Organization*. 83:747-755
- Kumaranayake, L. 2008. "The economics of scaling up: cost estimation for HIV/AIDS interventions." *AIDS*. 22 (Suppl. 1):S23-S33.
- Marseille E, L. Dandona, N. Marshall et al. 2007. "HIV prevention costs and program scale: data from the PANCEA project in five low and middle-income countries." *BMC Health Services Research* 7:108
- Osoro, N., P. Mpango, and H. Mwinyimvua. 2001. "An Analysis of Excise Taxation in Tanzania." *African Economic Policy Discussion Paper No. 72*, September 2001.
- Paxson, C. and N. Schady. 2008. "Does Money Matter? The Effects of Cash Transfers on Child Health and Development in Rural Ecuador." *World Bank Policy Research Working Paper* 4226.
- Pierani, P. and S. Tiezzi. 2009. "Addiction and interaction between alcohol and tobacco consumption." *Empirical Economics*. 37:1-23
- Preyra, C. and P. G. 2006. "Scale and scope efficiencies through hospital consolidations." *Journal of Health Economics*. 25:1049-1068.
- Rao, V., I. Gupta, M. Lokshin and S. Jana. 2003. "Sex workers and the cost of safe sex: the compensating differential for condom use among Calcutta prostitutes." *Journal of Development Economics*, 71: 585-603
- The Global HIV/AIDS Program. 2008. *West Africa HIV/AIDS epidemiology and response synthesis: implications for prevention*. World Bank Report
- Vassall, A., M. Remme and C. Watts, 2011. "Social Policy: Going upstream." *Assessment Paper: RethinkHIV*. Forthcoming
- Walker, D. 2003. "Cost and cost-effectiveness of HIV/AIDS prevention strategies in developing countries: is there an evidence base?" *Health Policy and Planning*. 18: 4-17

RethinkHIV RESEARCH PAPERS

Prevention of Sexual Transmission

Assessment Paper: Jere Behrman, Hans-Peter Kohler

Perspective Paper: Damien de Walque

Perspective Paper: Alan Whiteside

Prevention of Non-sexual Transmission

Assessment Paper: Lori Bollinger

Perspective Paper: Rob Baltussen, Jan Hontelez

Perspective Paper: Mira Johri

Treatment

Assessment Paper: Mead Over, Geoffrey Garnett

Perspective Paper: Robert J Brent

Perspective Paper: John Stover

Vaccine Research and Development

Assessment Paper: Dean Jamison, Robert Hecht, with Jared Augenstein, Gabrielle Partridge, and Kira Thorien

Perspective Paper: Steven S. Forsythe

Perspective Paper: Joshua Salomon

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Perspective Paper: Tony Barnett

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Perspective Paper: Till Bärnighausen, David E. Bloom, and Salal Humair

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