Staying Negative: How Repeatedly Receiving HIV-Negative Test Results Affects Perceived HIV-Risk and Risky Sexual Behaviors

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Abstract

Little evidence exists on how repeatedly testing HIV-negative might change perceived HIV risk or the level of risk taken in sexual behavior. The focus of this paper is to evaluate the impact of receiving repeated HIV-negative test results on changes in perceived HIV risk (worry about HIV infection, and perceived future likelihood of becoming HIV-positive) and changes in risky sexual behaviors (condom use with last partner, and number of partners in the last year). Using data from the Malawi Longitudinal Study of Families and Health (MLSFH), and fixed effects and/or random effects models, I will examine how perceived HIV risk and risky sexual behaviors change over time and the effect of repeatedly testing HIV-negative on these outcomes. I expect to find some decrease in perceived risk but it is unclear how HIV risk behavior will be affected by repeated testing.

Introduction

Little evidence exists on how repeatedly testing HIV-negative might change perceived HIV risk or the level of risk taken in sexual behavior. As stated in McCormack et al. (2014), "The role that repeatedly testing HIV negative while having condomless sex plays in reinforcing an individual's perception of their low-risk status merits evaluation." An unmerited decrease in perceived HIV risk could be problematic in high-risk populations or countries with a generalized epidemic such as Malawi. Given that current HIV testing recommendations include an explicit or implicit recommendation for testing repeatedly, knowledge of changes in HIV risk perception and risk taking behavior that may occur for repeat testers is important for developing effective counseling for to accompany HIV testing.

The focus of this paper is to evaluate the impact of receiving repeated HIV-negative test results on changes in perceived HIV risk (worry about HIV infection, and perceived future likelihood of becoming HIV-positive) and changes in risky sexual behaviors (condom use with last partner, and number of partners in the last year).

There are many benefits cited to repeat testing. For example, early detection of new HIV

infections is important for timely initiation of ART as part of a treatment as prevention approach (Cawley et al. 2013). Other observed factors associated with repeat testers are higher CD4 cell counts at diagnosis among repeat testers who eventually become positive and lower overall rates of HIV seroconversion (Regan et al. 2013). Lower overall rates of seroconversion imply an association between repeat testing and less risky behavior. However, evidence also exists that repeat testers may be more likely to be women, more likely to be those who engage in high-risk behavior and those more likely to have lower perceived HIV risk than non-repeat test takers (Bradley et al. 2011; Regan et al. 2013).

One drawback of all of these studies examining factors associated with repeat testers is that the data used is cross-sectional. Thus, changes over time in risk behavior or perceived risk for individuals as they receive more tests over time cannot be observed. To my knowledge, there are currently no studies examining repeat HIV testing that access longitudinal data for a more in-depth analysis of the relationship between repeat testing, risk behavior and perceived risk.

Data

The data to be used in this study is the Malawi Longitudinal Study of Families and Health (MLSFH), which is a longitudinal study in Malawi with data collection in 1998, 2001, 2004, 2006, 2008 and 2010. In 1998, the MLSFH randomly selected households based on census information from which to interview ever-married women and their husbands in three districts of rural Malawi: Rumphi in the north, Mchinji in the central region and Balaka in the south. The study design, sample selection, survey content, follow-up rates and attrition are described and documented in the *MLSFH Cohort Profile* (Kohler et al. 2014).

The MLSFH began asking questions about HIV/AIDS testing in 2004 and offered HIV/AIDS testing to participants in 2004, 2006 and 2008. In 2006, 2008, and 2010 data was collected on the number of times ever tested for HIV and the date of the last HIV test received. For at least 3 of the 4 survey years 2004, 2006, 2008 and 2010, information is also available about condom use with the most recent sexual partner(s) and the number of partners in the last 12 months. Information on worry about HIV infection and future likelihood of becoming HIV-positive is available in 2004, 2006, 2008 and 2010.

Methods

The main analysis will consist of fixed effects and/or random effects models (depending on the amount of between and within person variation found in the data). The models will examine the effect of changes in number of times tested for HIV (main independent variable of interest) on four main outcomes: changes in perceived HIV risk (worry about HIV infection, and perceived future likelihood of becoming HIV-positive) and changes in risky sexual behaviors (condom use with last partner, and number of partners in the last year). Furthermore, I will examine how repeat testing might have an effect on perceived risk among higher risk groups and lower risk groups separately (as defined by the two measures of risky sexual behaviors listed above). Descriptive statistics plus logistic, multinomial and/or linear regression will also

be conducted, examining (1) the effect of the number of HIV tests ever taken on perceived HIV risk and HIV risk behaviors for each survey year, and (2) effect of having an additional HIV test or tests between survey years on variables denoting changes in perceived HIV risk and risk behaviors.

Simple descriptive statistics are provided in this proposal in the accompanying table to show that the data will be sufficient to address the questions and conduct the analysis outlined above. These tables show that there is sufficient sample size and sufficient variability across time in the number of HIV tests taken and the outcome variables of interest.

Expectations

I expect to find that repeated HIV-negative test results lead to overconfidence in safety against HIV and possibly to underutilized prevention behavior. If results show that HIV risk behavior increases, or perceptions of HIV risk become unrealistic after repeated HIV-negative test results, extra attention should be given to counseling HIV test takers on the persistent HIV risk associated with risky sexual behavior. Alternatively, if no significant increase in risky behavior then current recommendations for repeat HIV testing among those in high-risk populations remains a sound and important element of HIV prevention that can be pursued without concern for hidden negative consequences.

References

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Table: Means and Percentages for distribution of main variables of interest across survey waves of MLSFH

Variables	Survey Year 2004	2006	2008	2010
Have you ever been tested for HIV? (% yes)	18.66	76.06	80.35	94.24
How many times have you been tested for HIV in your life?				
zero		23.94	19.65	5.76
one		59.61	23.06	11.50
two		12.15	28.35	18.48
three		3.00	15.38	23.44
four		0.49	6.71	12.80
five		0.18	3.41	10.58
six or more		0.11	3.26	17.43
How many sexual partners did you have in the last 12 months? (mean)		1.10	1.32	1.01
Have you ever used a condom with [most recent partner]? If so, how often did you use a condom with [most recent partner]?				
Never	81.08	76.66		75.48
At the beginning	4.77	5.32		8.35
Sometimes	9.68	17.07		13.52
Almost every time	3.26	0.52		1.56
Every time	1.13	0.38		1.10
How worried are you that you might catch HIV/AIDS?				
Not worried at all	33.27	57.22	51.15	51.54
Worried a little	24.78	25.67	24.45	25.77
Worried a lot	41.95	17.10	24.40	22.47
In your opinion, what is the likelihood (chance) that you will become infected with HIV/AIDS in the future?				
No likelihood	38.36	47.46	32.25	36.77
Low	26.99	33.93	36.07	39.37
Medium	11.04	10.69	20.60	14.72
High	6.06	7.92	11.08	7.63
Don't Know	17.55			1.49
Observations	2,304	2,741	3,230	3,462

Note: empty cells denote question not asked in that survey year