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Relationships between HIV Testing, Knowledge, and Stigma among Men: Reports from Belarus, Moldova, and Ukraine

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Abstract

A surge in heterosexual transmission of HIV among men in post-Soviet countries prompts the need to understand the determinants of HIV testing in the region. Survey data from Belarus (n = 2,769), Moldova (n = 1,545), and Ukraine (n = 3,620) were used to assess an influence of psychosocial determinants on testing among men. A mediation analysis for binary outcomes was used to assess effects of knowledge and stigma on testing. While knowledge had a positive influence on testing in each country, an indirect influence of knowledge through stigma was unique for each country. Implications for interventions and social work are discussed in the light of findings.

HIV testing; HIV knowledge; HIV stigma; binary outcome mediation; post-Soviet countries

INTRODUCTION

Unlike the rest of the world, the numbers of HIV cases in post-Soviet countries continue to increase. The Joint United Nations Program on HIV/AIDS reported that since 2010 new HIV infections declined or were relatively stable in most regions of the world, whereas Eastern Europe and Central Asia had a 57% increase in new HIV infections (Joint United Nations Program on HIV/AIDS [UNAIDS], 2016). Therefore, priority areas in national programs for tackling HIV epidemics include increasing knowledge of HIV transmission and prevention, and decreasing the stigma associated with an HIV status. The underlying assumption for intervention is this: increased knowledge about HIV, coupled with a reduction of the stigma attached to HIV, will contribute to a more successful containment of the HIV/AIDS epidemic. However, representative data show that only half of the population has comprehensive knowledge about HIV transmission and prevention methods, and the stigma attached to people living with HIV (PLHIV) is acutely pervasive within the region recognized as a "hotspot" in the global epidemiological landscape (National Coordination Council Moldova [NCCM], 2015; Ministry of Health Belarus [MHB], 2014; State Service of Ukraine [SSU], Ukrainian Centre for Socially Dangerous Disease Control [UCSDDC], & UNAIDS, 2014; Thorne, Ferencic, Malyuta, Mimica, & Niemiec, 2010).

Rates of HIV infection have increased in the post-Soviet region overall, but countries comprising the region are diverse, and HIV prevention and intervention activities tailored for one may not be effective for all. For example, although geographically proximate, Belarus, Moldova, and Ukraine experienced socio-economic transitions differently after the collapse of the Soviet Union (for a review of social and economic conditions in these countries, see Åslund and De Menil, 2000; Ioffe, 2004; Hensel & Gudi, 2004). HIV/AIDS trajectories also differed across the

three countries: of the estimated 318,328 PLHIV in the three countries, 13,527 live in Belarus, 14,801 in Moldova, and 290,000 in Ukraine (NCCM, 2015; MHB, 2014; UCSDDC & UNAIDS, 2014). Belarus (5.4/100,000), Moldova (11.4/100,000), and Ukraine (9/100,000) have had the highest AIDS prevalence across Eastern Europe in recent years (DeHovitz, Uuskula, & El-Bassel, 2014).

Initially, persons who inject drugs (PWIDs) were the primary population at risk for HIV infection (NCCM, 2014; MHB, 2015; SSU, UCSDDC, & UNAIDS, 2014). Epidemiological data provided by governments from recent years suggest there have been significant changes in HIV transmission routes: government sources and national HIV coordination councils report that there are now more cases of HIV from sexual contact than from drug use (NCCM, 2014; MHB, 2015; SSU, UCSDDC, & UNAIDS, 2014). Belarus reported 77%, Moldova 87%, and Ukraine 64% of new cases resulting from sexual contacts; with men representing a larger share of infection cases: 59% in Belarus, 54% in Moldova, and 56% in Ukraine (NCCM, 2014; MHB, 2015; SSU, UCSDDC, & UNAIDS, 2014). Some evidence also suggests that the bridging populations, such as labor migrants, may contribute to the spread of HIV through sex contacts (El-Bassel et al., 2011). In East Europe including Belarus, Moldova, and Ukraine, hepatitis infections, low CD4 cell counts, hypertension, anemia, and viral load status contribute to all-cause and AIDS-related mortality among PLHIV (Reekie at al., 2012). As of 2015, the number of deaths due to AIDS was approximately 1,000 in Belarus and Moldova, and 7,900 in Ukraine (UNAIDS, 2015). People living with a co-infection of HIV and tuberculosis in East Europe have a risk of death four-times higher than patients in West Europe and Latin America (Podlekareva et al., 2016).

HIV testing is central to the national HIV/AIDS containment strategies in the three countries, and it is widely available. Tests are offered free of charge at sexually transmitted infection (STI) treatment clinics, HIV centers, and private laboratories. In Belarus, Moldova, and Ukraine, target populations for testing include pregnant women, prisoners, tuberculosis patients, and STI patients (Mounier-Jack, Nielsen, & Coker, 2008). Evidence from European countries suggests that men tend to delay testing and are often diagnosed at late stages of HIV (Delpierre, Cuzin, Lauwers-Cances, Marchou, & Lang et al., 2006). However, there is little evidence about determinants of testing among men in post-Soviet countries.

Research indicates that stigma and knowledge about HIV influence testing behaviors of individuals. According to Goffman (1963), stigma is a "discrediting" attribute, which negatively affects the social identity of the person carrying the mark of stigma as well as social relations between stigmatized and "normal" individuals. Although cultural notions of normality and deviance inform stigma, the negative effect of stigma on HIV testing has been reported in various cultures throughout the world (Chesney & Smith, 1999; Genberg et al., 2009; Sherr et al., 2007; Sambisa, Curtis, & Mishra, 2010; Kalichman & Simbayi, 2003). Similarly, the negative impact of stigma on HIV testing within post-Soviet countries is to be expected. According to Goffman *deviance* is disrespect for social rules (1963). HIV in post-Soviet countries has been concentrated among individuals who inject drugs and engage in commercial sex work, who are consequently perceived as criminal, undeserving, and useless to society (Rechel, 2010). Moreover, these individuals are stigmatized because of perceived shortcomings in character. PLHIV in post-Soviet countries have reported that other people considered them immoral and not worthy of sympathy (Balabanova, Coker, Atun, & Drobniewski, 2006). PLHIV in Belarus, Moldova, and Ukraine encounter harassment and threats, and discriminatory practices

by government and medical personnel (Global Network of People Living with HIV [GNP] & Belarus PLHIV community, 2013; GNP & UKAID, 2012; Demchenko et al., 2011).

Another dimension of stigma from HIV/AIDS that is especially relevant to decisions of Eurasians to be tested is *social distancing*, which is expressed in avoidance of stigmatized people. For example, according to survey data from Moldova: 75% of respondents believed that children living with HIV should study in separate classes from the rest of the student population, and 25% of respondents believed that HIV-status should be reported in schools and work places (Soros Foundation–Moldova, 2011). In order to avoid the negative impact of the potential disclosure of HIV status, PLHIV in post-Soviet countries refrain from seeking medical help (Spicer et al., 2011; Terlikbayeva et al., 2013).

HIV knowledge includes understanding of modes of transmission as well as ways to prevent HIV infection (Wolfe et al., 2008). Contrary to stigma, studies conducted in various countries have shown that knowledge about HIV has a positive effect on decisions to seek HIV testing (Gage & Ali, 2005; Kouyoumdijan, Seisay, Karbo, & Khan, 2010; Matovu et al., 2005; McGarrigle et al., 2005; Solomon et al., 2006). For example, HIV/AIDS education increased test-seeking among men who have sex with men (MSM) (Rhodes et al., 2011). Evidence suggests that practitioners should consider cultural and local factors influencing behaviors of men. Intervention studies with MSM reveal that knowing the location of testing sites can increase HIV testing rates (McOwan, Gillece, Chislett, & Mandalia, 2002). Additionally, experimental data show that HIV testing is more likely when community-based testing is available compared to clinic-based testing (Sweat et al., 2001).

Limited evidence suggests that knowledge and attitudes of people are mutually related. For example, people who have less knowledge about HIV are more likely to have stigmatizing

attitudes toward PLHIV (Aggleton & Parker, 2002). And vice versa, in communities with strong stigma towards PLHIV, knowledge does not influence a decision to be tested (Kalichman & Simbayi, 2003). However, research on the relationship between knowledge, attitudes, and testing is not conclusive. This study contributes to the literature on HIV testing in two ways. First, the study utilizes data with large samples of men of three countries of the post-Soviet region, an understudied area where rates of HIV infection are expected to increase. Second, the study responds to recent calls to focus social work research and practice on men as an underserved population who are exposed to certain risk factors and diseases more than women (Shafer & Bellamy, 2016). We limited our analysis to men because men represent the majority of newly infected individuals in the three countries, and consequently need to be included in HIV-testing efforts, as well as men are prone to delayed testing, unlike women (who receive testing during antenatal care visits) and at-risk HIV populations (who are exposed to harm-reduction interventions). To offer new evidence about the role of knowledge and stigma on testing in post-Soviet countries, this study aims to answer the research question: How do knowledge and stigma affect the HIV testing among men in Belarus, Moldova, and Ukraine? Our hypotheses are:

H1) Knowledge about HIV transmission is associated with higher probability of testing;

H2) Stigma mediates the relationship between HIV knowledge and testing resulting in decreased probability of testing.

METHODS

Data Source and Sample

UNICEF's Multiple Indicator Cluster Surveys (MICS) from 2012, which provide reliable and high-quality data for health and related indicators in developing countries, were analyzed. The main goal of the MICS study is to obtain representative data on households with children

under five years of age, and consequently these households were oversampled [NCPHMHRM] & UNICEF, 2014; National Statistical Committee of the Republic of Belarus [NSCRB] & UNICEF, 2012; State Statistics Service & Ukrainian Center for Social Reforms, 2013). The MICS dataset includes a standardized weight for use when analyzing male subgroups and was applied in all the analyses. Although MICS surveys were not designed to be representative of the male population, they provide data about behaviors and attitudes of large samples of men that are not available elsewhere. Government and international experts designed the surveys, and trained personnel collected the data through visiting sampled households. Interviews were conducted in local (Belorussian, Romanian, and Ukrainian) and Russian languages.

Multi-stage stratification sampling was applied in each country. In Belarus and Moldova, population censuses were used as sampling frames. In Ukraine, election and village council databases were the sampling frames. Using sampling frames, MICS teams stratified regions in urban, rural, and large city strata. Next, they selected primary sampling units from strata with probability proportionate to size. Finally, they systematically or randomly selected households from the list of primary sampling units. Response rates ranged from 77% to 96%. The number of men who responded was 2,769 in Belarus, 1,545 in Moldova, and 3,620 in Ukraine.

Statistical Analysis

We report univariate and multivariate analysis. A mediation analysis for binary outcomes was applied to test if HIV-related attitudes mediate the association between HIV knowledge and testing. A bootstrapping method was utilized for estimating the unbiased confidence intervals for indirect effects. Version 14 of STATA software was used for the analysis. The study was exempted from a human subjects review by the Institutional Review Board (IRB) of the first author's university.

Measures

A dichotomous dependent variable (yes=1 and no=0) of HIV testing was based on responses to the survey question: "I don't want to know the results, but have you ever been tested to see if you have the HIV virus?"

Knowledge of HIV transmission and prevention. A summary score of HIV-related knowledge (0-7) was created on the basis of responses to seven items, with a higher score indicating more knowledge, similar to index measures that were empirically tested in previous studies (Genberg et al., 2009). The items were: 1) whether individuals can reduce their chance of getting HIV by having just one uninfected sex partner who has no other sex partners; 2) whether individuals can reduce their chance of getting HIV by using a condom every time they have sex; 3) whether individuals can get HIV by sharing food with an individual who has the AIDS virus; 4) whether it is possible for a healthy-looking individual to have AIDS; 5) whether the virus that causes HIV can be transmitted from a mother to her baby during pregnancy; 6) whether the virus that causes HIV can be transmitted from a mother to her baby during delivery; and 7) whether the virus that causes HIV can be transmitted from a mother to her baby by breastfeeding.

Stigma measures. To measure the desire to distance oneself from people living with HIV, respondents were asked two questions: 1) if a respondent would buy fresh vegetables from a shopkeeper or vendor who had HIV (no/not sure =1, yes=0); 2) if a female teacher with the HIV virus (but is not sick) should be allowed to continue teaching in school (no/not sure =1, yes =0).

To capture the differences in socio-economic contexts between countries, we included control variables, such as age (18-49 years), educational level (post-college=1, less than post-

college=0), marital status (married/in union=1, never married=2, divorced=3), residence type (urban=1, rural=0) and respondent's household wealth (poorest=1, poorer=2, middle=3, rich=4, and richest=5). Since measuring direct income is difficult in developing countries, surveys use household wealth as a measure of the economic well-being of individuals based on ownership of assets and amenities within the household. MICS experts develop a wealth measure using principal components analysis, which is included in survey datasets. An index measure of mass media exposure (frequency of reading newspapers, listening to radio, and watching TV) was based on exposure to media (not at all= 0; less than once a week=1; at least once a week=2; almost every day = 3). The score ranged from 0 to 9. Listwise deletion was applied for missing data due to a low number of missing observations (less than 1%) for independent and control variables.

RESULTS

Sample description

[Insert Table 1]

The highest percentage of the reported HIV testing was among men in Belarus (65%), followed by 57% in Ukraine, and 43% in Belarus. Age and education of men in three countries were similar (see Table 1). The highest percent of married was in Belarus (75% versus 56% and 67%). The highest percent of single men was reported in Moldova compared to Belarus and Ukraine (37% versus 17% and 24%). Knowledge of HIV was similar across three countries, 5.3-5.7 out of 7 points. There were differences in HIV-related attitudes across three countries: more men in Ukraine would not buy from a shopkeeper with HIV than in Belarus and Moldova (87% versus 76% and 75%); more men in Belarus would not allow a teacher with HIV to teach compared to Moldova and Ukraine (76% versus 75% and 62%).

Direct and Indirect Effects of Knowledge on Testing

[Insert Figures 1, 2, 3]

Figures 1-3 show a direct effect, an indirect effect of knowledge through stigma, and a total effect after adjustments for age, education, wealth, marital status, exposure to mass media, and residence type. Results indicate differing effects of knowledge on testing across countries. The direct effect of knowledge for Belarus was 0.08 [CI 95% 0.04, 0.12], while it was 0.21 for Moldova [CI 95% 0.16, 0.27], and 0.24 for Ukraine [CI 95% 0.21, 0.28]. Next, we consider indirect effects of knowledge through stigma. The total indirect effect of knowledge through stigma was 0.01 [CI 95% 0.02, 0.05] for Belarus, and .04 [CI 95% 0.02, 0.05] for Moldova. We find that knowledge of HIV transmission and prevention reduced stigmatizing attitudes towards shopkeepers with HIV for men in Moldova (b = - .21, p < .001) and Ukraine (b = - .19, p < .001). We also find that knowledge was associated with reduction in stigmatizing attitudes toward teachers with HIV: for one-point increase of knowledge, the coefficient for stigmatizing attitudes toward a teacher with HIV reduced by 0.22 (p < .001) in Belarus, 0.19 (p < .001) in Moldova, and 0.31 in Ukraine (p < .001). Next, we see that a stigmatizing attitude toward a teacher with HIV was associated with reduced testing probability in Belarus (b = - .44, p < .001) and Moldova (b = - .36, p < .001). The total effect including knowledge and stigma was 0.09 [CI 95% 0.04, 0.13] for Belarus, and 0.25 [CI 95% 0.19, 0.31] for Moldova. For Ukraine, knowledge had only a direct effect.

DISCUSSION

Post-Soviet countries face a difficult challenge of containing HIV infection, which is being spread through injection drug use and sex contacts. This study explores the relationship between HIV knowledge, stigma, and testing among men in post-Soviet countries. Building on

theoretical conception of stigma and evidence on HIV knowledge and stigma within various epidemiological and cultural contexts, this study clarifies the direct and indirect effect of knowledge on HIV testing among men in Belarus, Moldova, and Ukraine. As expected, research findings show that knowledge about HIV prevention and transmission is associated with increased testing probability. The second expectations, that stigma mediates the knowledge effect, was partially supported for Belarus and Moldova.

Positive association between knowledge and testing adds to prior research on testing among men (McGarrigle et al., 2005), suggesting that increased knowledge about HIV can be related to assessment of perceived risk behaviors and subsequent decision to seek testing. This is a promising finding providing evidence of positive effects of knowledge on behavioral outcomes of the population as national HIV/AIDS programs strive to educate and inform the population about the disease. Studies with pre-test, post-test designs have shown that educational programs increase HIV testing among men (Rhodes et al., 2011); given that a relatively small percentage of male populations in these countries has comprehensive knowledge of HIV transmission and prevention, national HIV coordination councils in these countries should continue their public education efforts. Informing the population about testing services and increasing availability of services through community-based interventions can increase testing rates and referrals of HIV positive people to treatment (McOwan et al., 2002; Sweat et al., 2001). Outreach workers can engage in educational and informational activities targeted specifically to increase the knowledge level among male populations.

Further, the effect of knowledge extends to stigmatizing attitudes. In the analysis, knowledge about HIV was associated with reduced social distancing from PLHIV, a consistent finding for Moldova and Ukraine. These findings add to scant research that has examined the

relationships between knowledge and stigma associated with HIV (Parker & Aggleton, 2002). These findings suggest that HIV-related interventions should utilize the positive effect of knowledge to reduce stigma in the populations.

One of the intriguing findings was that stigma did not mediate the relationship between knowledge and testing among Ukrainian men, but it did among the men in Moldova and Belarus. This finding may reflect sociocultural differences between the countries, as well as the scope of the respective HIV epidemics. For example, among European countries, Ukraine has the largest number of PLHIV (290,000), and multiple media campaigns have been conducted with participation of celebrities to encourage people to get tested. We speculate that because HIV is prevalent across demographic groups, it is relatively more acceptable in Ukraine for one's status to be known. Despite high levels of stigma towards HIV, the public health importance of being tested has gained traction, and assurances about the confidentiality of results positively affects test-seeking among men. In contrast, the incidence of HIV is lower in Moldova and Belarus, and new HIV infections are still largely concentrated among injecting drug users. Consequently, stigma associated with transmission routes is a dominant feature and negatively influences test-seeking among men.

Implications for Practice

Research about the role of social workers in HIV-related prevention and intervention programs in post-Soviet countries is notably absent. While social work is a nascent profession in the post-Soviet region, social workers are in a position to address HIV epidemics at multiple levels. Social work professionals in other regions of the world have accumulated a wealth of intervention approaches for HIV prevention. On a macro-level, social workers often confront the double stigma surrounding HIV: the stigma of drug use as the presumed transmission mechanism

and the stigma of an HIV diagnosis. Advocacy on behalf of HIV clients and their families to reduce stigma could be an effective tactic as research from other countries has shown (Naqvi & Ibrar, 2016). Social workers conducting intervention research with social service agencies in the US asserted that educational programs are more effective when local cultures are taken into account and that educational interventions about HIV prevention and treatment are more impactful when they (a) provide gender-sensitive educational materials, (b) utilize culturally congruent social marketing programs, and (c) consider local environments and cultures surrounding HIV infection (Auerbach & Beckerman, 2010; Beckerman & Auerbach, 2008). Social workers in post-socialist countries can follow the footsteps of their colleagues in other countries and increase effectiveness of HIV educational programs using successful examples from other countries.

Limitations and Conclusion

The limitations of this study derive from sampling and measurement limitations of the secondary data source. First, although the dataset includes large numbers of men, allowing the use of advanced statistical techniques, the data are not representative of the male populations in these countries. Additionally, given the considerable rates of labor migration of men from the post-Soviet countries to Russia, it would be ideal to oversample labor migrants in future studies of behavioral outcomes related to HIV. Alternatively, if questions about the labor migration experiences of men in these countries had been included, it would have been possible to examine or control for the migration effect. As with many population surveys, it is possible to analyze a broad range of variables, but they are not necessarily comprehensive. For example, future research should examine timing and frequency of testing, as well as validated scale measures of stigma instead of single items.

This is the first study to assess the relationship between psychosocial determinants and HIV testing among men in post-Soviet countries. Despite the sampling and measurement limitations, it expands the existing literature regarding knowledge and the stigma related to HIV in post-Soviet countries. As we outlined in the introduction, one aspect of research focuses on at-risk populations in post-Soviet countries; a second aspect of research describes the relationships between knowledge, stigma, and testing in other regions of the world. This study combines both aspects to provide an empirical assessment of the relationships among the underserved population of men within three post-Soviet countries, which are seeing an increase in the sexual transmission of HIV, with greater levels of stigma attached to PLHIV.

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Table 1. Frequency distributions for study variables

	Belarus (n=2,925)	**Moldova (n=2,007)**	**Ukraine (n=3,829)**
	%	%	%
Age 18-49 (M)	32.96 (8.13)	33 (9.31)	33.15 (8.24)
Post-college degree	26	26	32
Poorest household	23	32	24
Poorer household	20	11	20
Middle household	18	15	18
Richer household	18	16	18
Richest household	21	26	20
Married/in union	75	56	67
Never married/in union	17	37	24
Divorced/separated	8	7	9
Urban	72	57	66
Mass media exposure (M)	6.95 (1.91)	6.05 (1.99)	5.82 (2.11)
HIV knowledge (M)	5.70 (1.32)	5.28 (1.45)	5.69 (1.40)
Would not buy from a shopkeeper with HIV	76	75	87
Teacher with HIV should not be allowed to teach	76	62	75

Figure 2. Effects of Knowledge on Testing Mediated by Stigma for Moldova

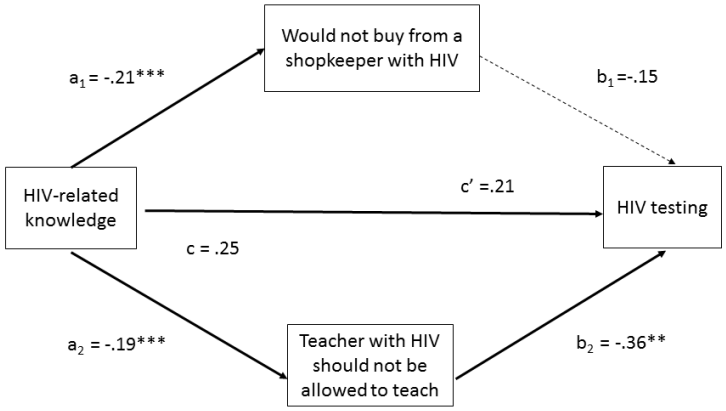

Figure 1. Effects of Knowledge on Testing Mediated by Stigma for Belarus

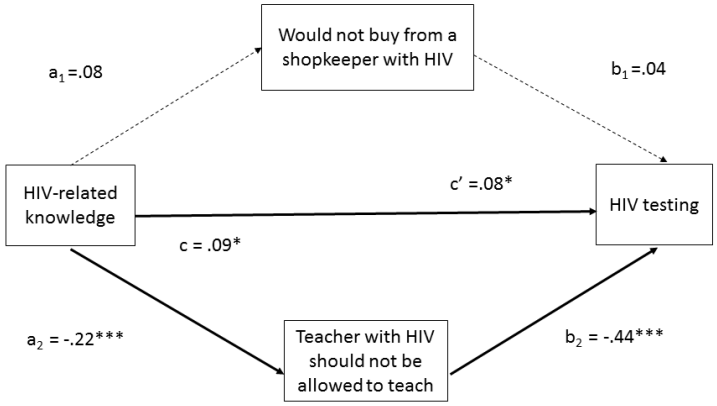

Figure 3. Effects of Knowledge on Testing Mediated by Stigma for Ukraine