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Editors' choice

Patterns of harm reduction service utilization and HIV incidence among people who inject drugs in Ukraine: A two-part latent profile analysis

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ABSTRACT

Background: Program utilization patterns are described within a large network of harm reduction service providers in Ukraine. The relationship between utilization patterns and HIV incidence is determined among people who inject drugs (PWID) controlling for oblast-level HIV incidence and treatment/syringe coverage.

Methods: Data were extracted from the network's monitoring and evaluation database (January 2011–September 2014, n = 327,758 clients). Latent profile analysis was used to determine harm reduction utilization patterns using the number of HIV tests received annually and the number of condoms, syringes, and services (i.e., information and counseling sessions) received monthly over a year. Cox proportional hazards regression determined the relations between HIV seroconversion and utilization class membership.

Results: In the final 4-class model, class 1 (34.0% of clients) received 0.1 HIV tests, 1.3 syringes, 0.6 condom and minimal counseling and information sessions per month; class 2 (33.6%) received 8.6 syringes, 3.2 condoms, and 0.5 HIV tests and counseling and information sessions; class 3 (19.1%) received 1 HIV test, 11.9 syringes, 4.3 condoms, and 0.7 information and counseling sessions; class 4 (13.3%) received 1 HIV test, 26.1 syringes, 10.3 condoms, and 1.8 information and 1.9 counseling sessions. Class 4 clients had significantly decreased risk for HIV seroconversion as compared to those in class 1 after controlling for oblast-level characteristics.

Conclusion: Injection drug use continues to be a major mode of HIV transmission in Ukraine, making evaluation of harm reduction efforts in reducing HIV incidence among PWID critical. These analyses suggest that receiving more syringes and condoms decreased risk of HIV. Scaling up HIV testing and harm reduction services is warranted.

Introduction

Ukraine has one of the highest burdens of HIV among European countries, with an epidemic that is primarily concentrated among people who inject drugs (PWID) (Zaller et al., 2015). There were approximately 325,000 to 425,000 PWID in Ukraine in 2012 (Berleva, Dumchev, Kasianchuk, Nikolko, Saliuk, Shvab et al., 2012; Berleva, Dumchev, Kasianchuk, Nikolko, Saliuk, & Yaremenko, 2012). HIV prevalence was estimated to be 19.7% in the 2013 bio-behavioral survey conducted among PWID from 29 cities (Balakirieva, Bondar, Loktieva, Sazonova, & Sereda, 2014). Studies had suggested that the HIV epidemic among PWID was slowing in Ukraine (Balakirieva, Bondar, & Denysuk, 2007; Balakirieva, Bondar, Sereda, & Sazonova, 2012; Degenhardt et al., 2014; Pohorila, Taran, Kolodiy, & Diyeva, 2009; Vitek et al., 2014); Vitek et al. (2014) reported that among PWID aged 25 years and younger annual HIV case reports decreased

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by 78% between 2005 and 2012 and prevalence in integrated biobehavioral surveys (IBBS) significantly decreased between 2009 and 2013 as well (9.9%–3.6%, p = 0.01). However, HIV prevalence increased to 21.9% among PWID in 2015 (Ukraine UNAIDS Global AIDS Response Progress Reporting [GARPR], 2016).

Complicating the HIV epidemic in Ukraine is an economic downturn (Iwanski, 2015) and armed conflict with the Russian occupation of Crimea in 2014 and an ongoing separatist movement in the Donbass region (Crawford, 2015). The current political and economic situation in Ukraine threatens to turn back the progress that has been made with respect to the HIV epidemic (Mackey & Strathdee, 2015). In its latest Global AIDS Response Progress Report to UNAIDS (Ukraine UNAIDS GARPR, 2016) Ukraine reported that 25% of people living with HIV (PLHIV) were on antiretroviral treatment (ART) and approximately 45,000 PWID live in the regions in conflict. Empirical data on the impact of the economic crisis and ongoing armed conflict in the Donbass region are not readily available. Indeed, the most recent GARPR report to UNAIDS (2016) consistently reported a lack of data for most indicators in most of the conflict areas (i.e., Crimea, Sevastopol City, Donetsk, and Lugansk). In addition, there has been loss of purchasing power for ART related to the devaluation of the hryvnia, difficulties with ART procurement, and delays in service provision.

The WHO has guidelines to delineate a comprehensive package of evidence-based HIV-related recommendations for key populations (Dutta, Wirtz, Baral, Beyrer, & Cleghorn, 2012; World Health Organization, 2014). Essential health sector interventions include condom and lubricant programming, harm reduction services for substance use (i.e., needle and syringe programs [NSP] and medication-assisted treatment [MAT]), behavioral interventions, HIV testing and counseling, HIV treatment and care, prevention and management of co-infections and co-morbidities, and sexual and reproductive health interventions. For PWID, four interventions are critical for the prevention and control of HIV and AIDS: NSP, MAT, antiretroviral treatment (ARV), and HIV counseling and testing. Ukraine's first NSP opened in Odessa in 1996 (*Police block needle exchange program*, 1997).

With respect to MAT, buprenorphine has been available in Ukraine since 2004 and methadone maintenance since 2007 (Dvoriak et al., 2014). However, coverage has been low with approximately 8800 patients receiving MAT as of September 2016 (Ukrainian Center for Disease Control, 2016). Access to MAT in Ukraine requires named-based registration with the national narcology service (Bojko et al., 2015; Makarenko et al., 2016), which is an important structural barrier to uptake. Since 2002, MAT has been financially supported by the Global Fund to Fight AIDS, Tuberculosis and Malaria; in November 2016 it was announced that MAT would be fully funded by the Ukrainian government's budget starting in 2017 (UNAIDS, 2016).

Alliance for Public Health (Alliance Ukraine), is a leading organization in Ukraine's response to the HIV/AIDS epidemic and works closely with civil society organizations, the Ukrainian Ministry of Health, and other governmental organizations. Alliance Ukraine manages prevention programs as well as provides technical assistance and financial support to local organizations. According to their 2013 annual report, Alliance Ukraine (2014) supported 76 non-governmental organizations (NGOs) throughout Ukraine which served an 63.4% (196,400) of the estimated total number of PWID in the country. Direct services for PWID included syringe distribution and exchange and pharmacy-based syringe exchange, among others. Although studies have described MAT and ARV coverage for PWID in Ukraine (Bruce, Dvoryak, Sylla, & Altice, 2007; Degenhardt et al., 2014; Zaller et al., 2015), there is a dearth of data on harm reduction service coverage and utilization.

This study aims to describe program utilization patterns within the large network of Alliance Ukraine-affiliated harm reduction NGOs and determine the relationship between utilization patterns and HIV incidence while taking into account relevant oblast-level measures of HIV prevalence and incidence and coverage of MAT, ARV, and syringes. Because resources for HIV testing, ARV (Wolfe, Carrieri, & Shepard, 2010), and MAT (Bojko et al., 2015; Wolfe et al., 2010; Zaller et al., 2015) are limited, this analysis also seeks to identify which venues for harm reduction services may be more effective in reducing the HIV burden among PWID.

Methods

Study population and data collection

Data for these analyses were extracted from Alliance Ukraine's SYREX database (Alliance Ukraine, 2015). SYREX was developed to register clients at harm reduction NGOs and collect data on the commodities (i.e., syringes and condoms) and services (i.e., counseling and information) provided. At each client visit, the number of syringes and condoms distributed is recorded, as well as whether HIV testing, information, or counseling were provided. Given that Alliance Ukraine is the only harm reduction provider in the country, the database includes data on all harm reduction clients in Ukraine. However, it should be noted that syringes are available for purchase in pharmacies, and most PWID buy syringes as well.

The raw SYREX dataset included 43,979,977 records on services and commodities provided in January 2011–September 2014. After aggregation by type of service, provision place/venue/modality and date, the resulting dataset included 26,350,972 episodes of service provision. Although there is guidance that prevention services have to be provided as a package (World Health Organization, 2014), numbers of episodes of individual services differed—there were 6,123,164 episodes of syringe provision, 5,064,058 episodes of condom provision, 3,003,768 episodes of informational materials provision, 3,203,871 episodes of counseling, and 249,046 HIV tests recorded. These five services were included in the analysis. The final dataset for analyzing patterns of harm reduction utilization included 327,758 clients from the 24 oblasts (i.e., regions), one autonomous republic (the Autonomous Republic of Crimea) and two cities with special status (Kyiv and Sevastopol) of Ukraine (Fig. 1).

For the final dataset, frequency variables were constructed for each unique client in all 27 administrative units of Ukraine. Frequencies were calculated for the number of commodities (i.e., syringes and condoms) and services received (i.e., information and counseling sessions) on average per month across the study period.

The main outcome of interest was HIV seroconversion. In any given year, there were enough rapid HIV test kits to test approximately 40% of clients. However, HIV testing was not randomly distributed (i.e., those at highest risk [e.g., received more condoms and needles] tended to be tested more frequently (Denisiuk et al., 2014)). Thus, 32,743 clients had a first negative HIV test result and at least one follow-up test over the entire study period; this was the sample for analyses of HIV risk (Fig. 1).

In addition to client-level data, oblast-level indicators characterizing the status of HIV epidemic and coverage of treatment and prevention programs were included in the analyses (Table 1). These included number of newly registered cases per 100,000 population, proportion of PWID among newly diagnosed cases from Ukraine Ministry of Health official statistics for 2014 (Ukraine Ministry of Health, 2015), and HIV prevalence among PWID aged 25 years and younger (Balakireva, Bondar, Loktieva, Sazonova, & Sereda, 2014). The total number of syringes distributed in 2011–2014 and number of patients on MAT at of the end of 2013 were extracted from SYREX. Using the estimated PWID population size (Berleva, Dumchev, Kasianchuk, Nikolko, Saliuk, Shvab et al., 2012;