CONCISE COMMUNICATION

HIV seroprevalence among orphaned and homeless youth: no place like home

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Objectives: We evaluated the combined influences of orphaned status and homelessness on HIV seroprevalence and risk among street-involved Ukrainian youth in 2008.

Design: Systematic, multi-city, community-based, cross-sectional assessment.

Methods: Time-location sampling was used to identify eligible youth ages 15–24 after city-wide mapping of 91 sites where street-involved youth gathered in Odessa, Kiev, and Donetsk. Universal sampling identified 961 youth in 74 randomly selected sites; 97% consented. Youth reporting 1 or both parents dead were classified as orphaned; those without a stable residence or sleeping outside their residence ≥2 nights/wk were classified as homeless. Trained staff provided HIV counseling and rapid testing via mobile vans. Adjusted odds ratios (AORs) were calculated using logistic regression, accounting for intra-cluster homogeneity.

Results: We found 32% (300/929) were both orphaned and homeless; 48% either homeless/not orphaned; 37% (343/929) or orphaned/not homeless; 11% (104/929); and 20% (182/929) neither orphaned nor homeless. HIV seroprevalences were 7% for neither orphaned/homeless; 16% and 17%, respectively, for either orphaned/homeless; 28% for both orphaned/homeless (p for trend <.0001). Adjusted odds ratios for HIV infection were 1.0 for neither; 2.3 and 2.4 for either homeless (95% confidence interval CI 1.8–3.3); 3.3 for both orphaned/homeless (CI 2.3–4.4). Ever-use of injection drugs increased from 15% to 32% to 48% for those who neither, either, or both orphaned and homeless, respectively (p for trend <.0001).

Conclusions: One of four youth who were both homeless and orphaned was HIV-infected; these youth were significantly more likely to be HIV-infected and to report injection drug use than those with adequate housing and living parents.

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Introduction

During the past 5 years, UNICEF estimates of the global orphan population have increased from 132 million in 2005, to 145 million in 2008, to 163 million orphans in 2009 [1–3]. UNICEF, UNAIDS, and USAID define ‘orphans’ as those under age 18 with one or both parents dead [2–4]. Even though youth who are ages 18 and older when they lose parents are excluded from orphan counts, it is likely that parental loss during this developmental stage, denoted in the psychology literature as ‘extended adolescence,’ increases their social vulnerability. Around the world, growth in the HIV epidemic is associated with social devastation, leaving increasing numbers of children as orphans after their parents succumb to the disease. However, relatively little attention has been devoted to increases in the numbers of HIV cases that may occur as a consequence of growth in the orphan epidemic.

Although half of all new HIV cases worldwide occur in youth ages 15 to 24, data are not available to estimate the numbers of youth–associated cases occurring in orphaned and homeless youth [5]. Studies in Africa and Eastern Europe report that orphaned youth have higher HIV risks than non-orphaned youth [6–14], leading Birdthistle to describe orphans as transitioning from ‘affected’ to ‘infected’ [11]. Assessments of structural indicators of vulnerability, such as housing, report elevations in HIV seroprevalence ranging from 3 to 68% among homeless populations [13–19]. Although the interplay between social and structural determinants is receiving increased attention [20,21], to our knowledge, this is the first report to address the combined influences of orphan status and homelessness on HIV seroprevalence among youth.

Methods

The methods for this rapid assessment have been described [14]. Briefly, we conducted a multi-site HIV seroprevalence assessment among street-involved youth in three Ukrainian cities, after systematic mapping to identify venues where street youth congregate. We offered voluntary rapid HIV testing and interviews to eligible youth.

Our target population was 15–24 year old, street-involved youth living in Odesa, Kyiv, and Donetsk. Eligibility criteria for minors aged 15–17 specified they be found at street venues without parents, and ≥1 of the following: did not attend school regularly; live out of family care; live full- or part-time on the street; or self-identify as “street youth”. Eligibility criteria for youth 18–24 included living part- or full-time on the street, or self-identifying as “street youth”.

We defined ‘orphaned’ as youth with one or both parents dead. Although data on age at the time of parental death were unavailable, it is likely that 60% (n = 240) of those classified as ‘orphaned’ experienced parental death before age 18 (meeting UNICEF, UNAIDS, and USAID definition of orphan), as they were either ≤ age 17 or had lived in an orphanage/shelter during childhood. The remaining 40% reporting parental death includes those whose parents may have died before they reached 18 as well as those experiencing parental loss at ages 18–24. We refer to both those with no place of residence (homeless) and those spending ≥2 nights weekly outside their usual place of residence (marginal housing) as ‘homeless’ in the interest of parsimonious terminology. Russian experts who were leaders of non-governmental organizations highly experienced in serving street youth populations locally advised that those youth sleeping ≥2 nights outside usual residences comprised a valid indicator of marginal housing in this particular cultural context and were at high risk of becoming homeless.

We adapted time-location sampling [22] to map public venues where street-involved youth congregate. Venues were randomly selected, and eligible youth present were universally sampled. Assessments were conducted May–December 2008 by teams working from mobile vans equipped for counseling and rapid HIV testing (on finger-stick blood, Determine rapid HIV 1/2 test, Abbott laboratories, Abbott park, Illinois, USA, 100% sensitivity; 99.6%–100% specificity) [23,24]. Study staff completed pre-test counseling and interviews; provided rapid test results, post-test counseling, information on HIV prevention and services, and small gifts including food, clothing or condoms. Social workers coordinated referrals for HIV-positive youth for free confirmatory HIV testing (using Western blot); clinical, immunological and virological evaluations; antiretroviral treatment, care and support at City AIDS Centers.

We estimated HIV seroprevalence and computed Mantel-Haenszel chi-squared tests for trend to examine associations between orphaned/homeless status, and testing HIV-positive. We established the following groups: those who were neither orphaned nor homeless; those who were either orphaned but not homeless or homeless but not orphaned; and those who were both homeless and orphaned; then used logistic regression to estimate adjusted odds ratios (AORs), with 95% confidence intervals (CIs). The model was adjusted for gender, age, and city; due to multicollinearity among several predictors, we adjusted for the strongest sexual and substance use confounders. SAS-callable SUDAAN software (Research Triangle Institute, Research Triangle Park, NC, USA) was used to account for intra-cluster homogeneity within sites and cities. The protocol was reviewed for ethical concerns by the CDC and deemed to be exempt from Institutional Board.
Evaluation because of its focus on public health practice and linkage into clinical care. A board of authorities from the Ukrainian Ministry of Family, Youth, and Sports and from the Ministry of Health reviewed and approved the protocol for ethical concerns given the existence of a legal basis for offering testing to those over the age of 14 years as part of the Ukrainian Civil Code (Chapter 21, Article 284). Great care was given to guarding confidentiality of participants at all stages of the assessment; no identifying information was collected on any participants; only nicknames were collected by local project staff to link participants into follow-up care.

Results

After citywide mapping, 91 venues were identified and 74 randomly selected. Study staff approached 961 eligible youth, of whom 929 consented (97%). We found the following distributions: 20% (182/929) were neither orphaned nor homeless; in the either category were 37% (343/929) homeless/not orphaned and 11% (104/929) orphaned/not homeless; and 32% (300/929) were both orphaned and homeless.

HIV infection rates increased from 7% (13/182) among those who were neither orphaned nor homeless; to 16% (55/343) and 17% (18/104), respectively, among those who were either homeless or orphaned; to 28% (85/300) among those who were both orphaned and homeless (Fig. 1, p for trend <.0001). In sensitivity analyses which excluded youth from the ‘orphaned’ subgroup who had no indicators of participant’s age at the time of parental death, seroprevalences were similar to those reported (data not shown). After adjustment for gender, age, city, lifetime injection drug use and past sexually transmitted infection, AORs for HIV infection for the sample of 929 increased progressively, from 1.0 for those who were neither orphaned nor homeless; to 2.3 (CI 1.7–2.9) and 2.4 (CI 1.8–3.3) for those who were either homeless or orphaned, respectively; to 3.3 (CI 2.3–4.4) for those who were both orphaned and homeless.

We considered proximate behavioral pathways through which distal risk factors, homeless and orphaned status, may have influenced HIV seroprevalences (Table 1). We observed significant trend effects for important substance use behaviors: ever use of injection drugs increased from 15% for those who were neither, to 32% or those who were either, to 48% for those who were both orphaned and homeless (Table 1). Ever use of drugs increased from 61% for the neither group, to 71% for the either group, to 84%...
for those who were both orphaned and homeless, similarly, the prevalence of initiating sexual activity before age 15 years increased from 32% to 40% to 59% for the neither, either, and both orphaned and homeless groups; the prevalence of having ≥6 sex partners in the previous year increased for these groups from 23% to 28% to 33%, respectively. Trends were observed across categories of orphaned and homeless status in prevalence of no condom use at last sex and alcohol abuse.

**Discussion**

We observed a significant trend effect in HIV seroprevalences, with lowest HIV rates in those who were neither homeless nor orphaned, intermediate seroprevalences in those who were either homeless or orphaned, and highest seroprevalences in those who were both homeless and orphaned. One out of every four youth ages 15 to 24 who were both homeless and orphaned were HIV-infected, and these youth were three times more likely to be HIV-infected than those street-involved youth with both adequate housing and living parents. Furthermore, we found consistent trends for lifetime use of injection drugs, as well as a range of other behavioral predictors, with lowest prevalences for those who were neither orphaned nor homeless, intermediate prevalences for those who were either, and highest prevalences among those who were both orphaned and homeless.

Previous reports have identified a number of structural and social determinants of HIV risk. Often, as we found, behavioral factors such as substance abuse are also highly correlated with social and structural factors that increase HIV risk. As reported previously for this study population, injection drug use was independently associated with HIV infection in this population, after adjustment for a number of other co-variables, including homelessness, orphaned status, working for pay, sexually transmitted infections, and demographic variables (adjusted odds ratio 9.0) [14]. Structural factors known to increase HIV risk include criminalization of substitution therapy; absence of needle exchange programs; absence of policies requiring condom use for sex workers; absence of legal sanctions against gender-based violence; legal barriers to HIV testing for minors; inadequate funding for HIV prevention in prisons; homelessness; and poverty; in contrast, microfinance programs which provide employment opportunities may reduce HIV risk [20,21,25,26]. Social factors that increase HIV risk include childhood abuse, familial dysfunction, low educational attainment, low family connectedness, lack of mentors, and lack of involvement in youth development activities [9,10,15,27–30].

To our knowledge this is the first report to estimate the combined effects of orphaned status and homelessness on HIV risk in a systematic, multi-city sample of nearly one thousand street-involved youth. 'Home,' according to Miriam–Webster’s dictionary, is comprised of both family and domicile, that is, people and place; our findings quantify the dire impact for those whose unstable housing and parental loss may leave them with ‘no place like home.’ Nevertheless, evidence suggests that cost–effective prevention strategies which include substitution therapy for injection drug users, can reduce HIV infection rates and associated risk behaviors in homeless and orphaned youth. Both observational and randomized trial data demonstrate that providing housing is a structural intervention which can reduce HIV risk [31–33]. Furthermore, alternative family initiatives for orphans, conditional cash transfers, and extending foster care for orphaned youth through age 21 appear to reduce the risk of HIV infection [34–37].

Given the high prevalence of HIV in our study population and the high sensitivity and specificity of the Determine rapid HIV-1/2 antibody test, it is unlikely our findings were substantially biased by either false negative or false positive test results. Furthermore, since any misclassification due to self report of parents’ vital status and housing status should have been non-differentially distributed between the HIV-infected and
The findings and conclusions in this report are the official position of the Centers for Disease Control and Prevention.


Results presented at: Society for Epidemiologic Research, Seattle, Washington, 2009

References

3. Third Annual Report to Congress on Public Law 109–95, Congress mandated that the US government provide assistance to orphans and highly vulnerable children and youth in countries with high HIV seroprevalences. However, few studies have characterized HIV seroprevalences among street-involved youth, who are one of the most vulnerable populations and who have been denoted by UNICEF as Most at Risk Adolescents [38]. The 2009 Annual Report to Congress on Highly Vulnerable Children estimates that worldwide 32 %, or 640 million of the 2.2 billion children under the age of 18 are marginally housed and that 7%, or 163 million, are orphans [3]. The sheer magnitude of these numbers, coupled with the fatal threat posed by HIV infection when there is limited access to antiretrovirals, constitutes a burgeoning public health crisis which demands an urgent prevention response. Otherwise, in the words of Albina Du Boisrouvray, founder of the Francis Xavier Bougnand Foundation, orphans may be destined to become “the second wave of the HIV epidemic” [39].

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Conflicts of interest

Disclaimer: The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

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