Access to and use of sexual and reproductive health services among street children in Uganda: Does Migration matter?

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Abstract

Background

While the nexus of migration and health outcomes is well acknowledged, the effect of rural-urban migration on uptake of sexual and reproductive health (SRH) services has received less attention. We assessed the effect of rural-rural urban migration on uptake of SRH services and whether there is a difference in uptake of SRH services among migrant and non-migrant street children.

Methods

Data were collected among 513 street children aged 12-24 years using face-to-face interviews. Participants were recruited by venue-based time-space sampling (VBTS). Using STATA 16.00, we performed multivariate binary logistic regression to identify correlates of SRH service uptake with migration status as the main predictor while controlling for confounding. In this study, migrants are defined as children who had moved to settle in the city for at least 24 months preceding the survey.

Results

Overall, two-thirds (66.82%) of children had moved to the city in the last 2 years, 20% in the last 3-5 years and 13.18% in 6 years or longer. Only 18.13% of the street children had ever used contraception/family planning, 45.89% had ever tested for HIV and knew their status while 34.70% had ever been screened for sexually transmitted infections. Multivariate analysis shows that migrant street children had reduced odds of using sexual and reproductive health services (HIV testing, use of contraception and screening for STIs) compared to the lifelong native street children (aOR=0.59, 95%CI 0.36- 0.97). Other factors associated with use of SRH services among street children include age (aOR=4.51; 95%CI 2.78-7.33), schooling status (aOR=0.34; 95%CI -1.83 0.15-0.76), knowledge of place of care (OR=3.37,95%CI 2.04-5.34) and access to SRH education information (aOR=2.7, 95%CI 1.67- 4.53).

Conclusion

Rural-urban migration is associated with low SRH service uptake. Access to and use of SRH services among migrant street children is low compared to non-migrant street children. Our findings point to the need for urban health systems to design effective interventions to improve equitable access to
and use of quality SRH services among street children while taking into consideration their migration patterns.

**Background**

Rural-urban migration has been at the centre of debates around urbanisation and development at the global, continental and national levels. Migration of children and young people receives less attention in a migration cycle(1). The urban population in the sub-Saharan Africa region is projected to increase from under 40% currently to over 60% by 2050(2). Street children, often defined as individuals for whom the streets have become their place of living and/or source of livelihood, are among the most marginalised and vulnerable groups living in urban settings(3). Street children face several health risks including high rates of unwanted pregnancies, sexually transmitted infections, sexual violence and poor maternal and child health outcomes(4)(5)(6). Within the Ugandan context, these street children are not immigrants in the usual sense as they stay for periods in the city, sometimes go to their districts of origin, and then return to the cities. They include both children of and children on the streets(7)(8).

Literature on the effect of rural-urban migration on sexual and reproductive health choices remains scanty. Existing research output focuses disproportionately on a few categories of migrants and health concerns, and on migration to and from high-income countries(9)(10)(11)(12). In Italy, female immigrants are at greater risk of receiving inadequate healthcare services and poor quality outcomes during their pregnancy and delivery compared to native females(13). These studies demonstrate that migrants are more likely to use modern contraception and antenatal care than non-migrants. A few studies in sub-Saharan Africa demonstrate impact of migration on health care and risks, with migrants exhibiting higher risk for acquisition of HIV and other sexually transmitted infections than non-migrants (14)(15)(16). Rural-rural migrant and rural non-migrant women were more likely to experience unmet need compared to urban non-migrant women(17). Conversely, migration has positive impacts at individual level, allowing migrants to build their self-confidence and acquire skills and competencies beneficial to both host and destination communities (18).

Internal migration is a much larger phenomenon that affects the lives of far more people, and yet
given much less attention (19). In Uganda, an increasingly internal migration phenomenon resulting from urbanisation has caused an influx of street children who are most at risk in all fronts (20).

Although there has been progress in the policy space around adolescent SRH issues in Uganda, the implementation of SRH programs, especially those impacting the most vulnerable groups such as the migrant street children, remains problematic. Street children represent a minority population that has been under-represented for too long in national surveys and health research. Moreover, current national policies and plans do not recognise them as a vulnerable population (21). The question of whether internal migration influences access to and use of SRH services among street children and adolescents has not been fully answered in previous literature. The findings are critical for guiding the development of urban policy and programmatic interventions that are responsive to migration and sexual and reproductive health needs of street children in Ugandan cities. Moreover, this paper contributes to the understanding of the nexus between migration and sexual and reproductive health service use among urban young vulnerable populations. Finally, a strategic focus on the SRH of the street adolescents, an otherwise difficult-to-reach group, will enable Uganda in achieving its national targets on universal access to SRH information and services- by leaving no one behind.

The study is implemented within the context of internal migration of young people to Ugandan cities. Kampala capital city serves as the major commercial centre of Uganda with approximately 1,507,080 residents. While the actual number of street children is not well documented, anecdotal sources estimate a population of 10,000 street children in Uganda, majority of whom live in Kampala city (32) (33). All regions in Uganda have experienced rural-urban migration with the majority (32%) of the street children reported to be coming from the Karamoja sub-region(34). Availability of health facilities in Kampala capital city remains the highest in the country at 8.4 facilities per 10,000 population (35). The average household size is 4.7 persons, with a Sex Ratio of 94.5 males per 100 females (36).

**Conceptual framework**

The conceptual framework of this study borrows from the social ecological model (SEM) of health behaviour to understand the interaction between several predictors of SRH use among the street
children including internal migration aspects (22)(23). The ecological models explicitly consider the broader community, organizational and policy contexts of behaviour while incorporating social and psychological influences, which in our study context is deemed most appropriate (23)(24)(25). Within the context of global migration, other competing theories may explain association between migration and reproductive health behaviours. These include, the healthy migrant effect model which posits that, over time, individuals who migrate could have healthier behaviours and better outcomes than the native population (26)(27). The adaptation hypothesis posits that the reproductive health and behaviour of migrants comes to resemble that of the local population at migrants’ destination (28) (29). The selection hypothesis posits that migrants are a population whose behaviours are healthier than the general population in their home communities (30)(31). The study variables used in the study conceptual framework are shown in Figure 1.

Methods

Aim, design, setting and sampling

This systematic study primarily focuses on assessing the relationship between rural-urban migration and uptake of (SRH) services among street children in Kampala Capital City, Uganda. A cross-sectional study, involving face-to-face interviews, was conducted among children aged 12 – 24 years who; 1) have continuously stayed for at least 3 months in Kampala capital city prior to the study, 2) spend most of their time on the streets of Kampala capital city, and 3) consented to participate in the study were enlisted. Participants who are unable to provide the required information either due to illness were excluded. Being a hard-to-reach population, we used a two-stage cluster sampling for floating populations (venue-based time-space sampling). First, in order to identify the parishes and geographic locations/venues where street children congregate during daytime, we conducted a rapid mapping exercise in three of the five purposively selected divisions of the city. The venues served as the primary sampling units for data collection and were selected with equal probability. New venues were added if the research assistant noticed other locations in the field that were not on the initial list. Second, at each of the selected venue, we applied respondent driven sampling (RDS) to recruit the eligible street children from their network groups for participation in the interviews. Since the
numbers of the street children during the fixed time interval was small (15 or fewer), we interviewed all eligible street children found in the venue. RDS is a chain referral sampling method that produces a stable sample regardless of the make-up of initial recruits (Heckathorn 2002). In total, we enlisted a total 167 venues in 27 parishes selected from three of five city divisions. The identification of the locations and clients was made possible with the help of local urban leaders, service provider NGOs and/or street children landlords/caregivers. Venue-based time space sampling techniques are widely applied elsewhere to sample hidden populations for the purpose of collecting survey data (37).

Dependent variable

We created a binary composite variable “sexual and reproductive health (SRH) service use” from three dependent variables, namely: Use of contraception or family planning in lifetime; HIV testing in the past 12 months and sexually transmitted infections (STI) screening in the last 12 months preceding the survey. All the three variables were categorized into the binary outcome ‘Yes’ and ‘No’. Hence a participant who responded “yes” to either of the three questions was considered to have ever used SRH services: a) In the past 12 months, have you sought for STI testing/screening? (Yes/No); b) In the last 12 months, have you taken an HIV test and know your HIV status? (Yes/No); and c) Have you ever used any modern family planning in the last 12 months? (Yes/No); Positive responses to the above questions were further validated with follow-up questions on the type of SRH/family planning services utilized and STI symptoms experienced. A positive (“yes”) response to any one of these services was regarded as service utilization. Previous studies have used self-reports as a measure of health service utilisation and is thus deemed a reliable method (38)(39). In the final model, we report results for the composite variable, SRH use, as the main outcome variable.

Independent variables

The independent variables were selected based on the study conceptual framework as shown in figure 1. Rural-urban migration aspects measured include the following: place (district/region) of origin, duration of stay, residential mobility and number of return movements to the city. Specific questions included: In which district/region were you born?; Which year and month did you first come to arrive to settle in Kampala Capital city?; For how long have you stayed in Kampala capital city?;
How many places have you stayed in since you first settled/arrived in the city? In the past 24 months, have you returned to your home district/region of origin? (Yes/No). If yes, how many times did you go back to your place of birth/origin and returned to the city (round trips)? In this study, street children are defined as persons aged 12 to 24 years who migrated to and have stayed in Kampala city for period of not more than 24 months were classified as “migrant street children” while street children who had lived in the city for more than 24 months were considered “non-migrants or lifelong natives”. Children who had more than one repeat movements to their district of origin in the past 24 months preceding the survey were classified as “circular migrants”. Previous studies have used similar categorisations for migration status (40)(41). Other predictor variables include participant’s characteristics such as age, sex, marital status, schooling experience, education level, daily income and living arrangements, as demonstrated in the study framework.

Procedures
Between May and July 2019, data were collected using a pretested interviewer-administered semi-structured instrument programmed in English and two local languages, Luganda and Ngakarimajong, on mobile android PDA using CTO Survey tool. Luganda and Ngakarimajong are the most spoken languages by the street children. The electronic tool ensured minimisation of errors and completeness of interviews. Since the street children are connected through social networks, eligible respondents were recruited through respondent driven sampling in which street children had to lead the researcher to their peers for inclusion in the study. To ensure comprehension and high response rate, a team of 14 trained male and female research assistants who were fluent in both English and a local language conducted the interviews. All interviews took place in private spaces at the selected venues where street children congregate during the day. Written consent was obtained before interviews with the street children. A typical interview took less than 35 minutes. A venue was visited once, and all interviews were completed in 7 days. The principal investigator, biostatistician and study coordinator supervised the data collection process.

Data Analysis
To examine the effect of rural-urban migration aspects as the main independent variable and related
predictors on the uptake of SRH services, we performed a stepwise binary logistic regression analysis using Stata version 16.00 version while controlling for confounding. All analyses were two-tailed, and a $p$-value of 0.05 or less was deemed statistically significant. Choice of variables in the final model was guided by the conceptual framework including assessing for multicollinearity among predictor variables. In all analyses, the levels of influence of the social ecological model were considered.

**Results**

**Background Characteristics**

Table 1 shows significant differences in demographic characteristics between migrant and non-migrant street children. Overall, 55.36% (n=284) were migrant street children while 44.64% (n= 229) were lifelong native street children. The median age was 18 years (interquartile range 16-21 years) with the majority (35%) in the 18-20 age group. Two-thirds (66.82%) of children had moved to the city in the last 2 years, 20% in the last 3-5 years and 13.18% in 6 years or longer (data not shown). More migrant street children (76.50%) than non-migrant street children (58.57%) had attained pre-school or primary school education. More than three quarters (89.67%) of the street children were not in school. Most (79.53%) of the street children were not married and only 16.76% were either married or living with a partner. More than half (54.97%) of the street children stayed with a friend or partner while 10% stayed alone. Migrant street children earned more than the threshold value of 1USD daily compared to the lifelong native street children.

**Prevalence of Use of SRH services**

Table 1 findings show that 61.99% (n=318) of the street children had received at least one component of the SRH services in the last twelve months while 11.50% (n=29) had received all the three SRH services (STI screening, HIV testing & FP use). Across all the SRH service components, use of services was generally lower among migrant compared to the non-migrant street children, with 51.76% migrants having ever tested for HIV in the past 12 months compared to 67.25% of the lifelong native street children; use of any modern family planning method was low with 14.14% of migrant street children compared to 22.71% of non-migrant street children. Similarly, prevalence of STI screening was lower for migrant street children compared to lifelong native street children. The
differences in SRH use are significant at the 5% p-value. The commonly used FP method was a condom (77.03%). The majority (68.39%) of the participants accessed SRH services from public health facilities while 31.61% of the street children sought SRH services from NGO/private health facilities (data not shown).

**Effect of migration and related factors on uptake of SRH services among street children**

Table 2 shows findings from the bivariate analysis of socio-demographic and migration variables on use of SRH services among street children shows significant differences in service utilisation. Use of SRH services was associated with increasing age, with those aged above 18 years being 5.8 times more likely to use SRH services than the younger age group (cOR=5.84, 95%CI 3.95-8.64); In regards to marital status, street children who were married were 2.4 times more likely to use SRH services than those in non-conjugal relationships (cOR=2.47, 95%CI 1.43-4.26); Street children who perceived themselves as permanent residents of the city were twice likely to use SRH services than the mobile/seasonal street children (cOR=1.93, 95%CI 1.32-2.81); Use of SRH services more than doubled with attainment of post primary education (cOR=2.71, 95% 1.69-4.34); Intra-urban residential mobility (movement between urban spaces) was associated with SRH service use among street children (cOR=2.13, 95%CI 1.43-3.15). However, the odds of using SRH services decreased with migration status (cOR=0.52, 95%CI 0.36-0.74), duration of stay (cOR=0.64, 95%CI 0.42-0.97) and tribe/ethnicity (cOR=0.56, 95%CI 0.37-0.82). The reduction in odds in use of SRH services among migrant compared to non-migrant street children further supports our hypothesis that migration and mobility negates street children’s ability to use SRH services in urban spaces.

**Migration as the main predictor of uptake of SRH services**

Table 3 shows findings from the multivariate binary logistic regression modelling with SRH use as the main outcome variable. Our final model included ten predictors of SRH use including age, sex, education, income and other known predictors including migration status. The findings reveal that migrant street children had reduced odds of using sexual and reproductive services compared to the lifelong native/non-migrant street children (aOR=0.59, 95%CI 0.36-0.97), implying that migrant street children were 41% less likely to use the SRH services than the native street children. However, we did
not find a significant relationship between circular migration (having more than one repeat movement between the city and place/district of origin) and uptake of SRH services among the street children. Other factors that predicted use of SRH services among street children include age, knowledge of place of care for SRH services and access to SRH education information. Street children older than 18 years were four times more likely to use SRH services (aOR=4.51; 95%CI 2.78 - 7.33); In-school street children were 66% less likely to use SRH services compared to their out-of-school counterparts (aOR=0.34; 95%CI 0.15 - 0.76). Street children with knowledge of place of care were three times more likely to use SRH services compared to those without knowledge of facility of care (aOR=3.37, 95%CI 2.04 - 5.34). Street children who reported having access to SRH education information were three times more likely to use SRH services than those did not have access to information (aOR=2.7, 95%CI 1.67 - 4.53).

Discussion

**Association between migration and SRH service uptake**

This is the first study in Uganda to investigate the nexus of rural-urban migration on use of SRH services among street adolescent and young people in an urban setting. Our study examined migration-related factors that may influence uptake of SRH services among street children in Kampala city, Uganda. Returning to the question of whether rural-urban migration affects use of SRH services, our findings suggest that migrant street children are less likely to use SRH services than the lifelong native counterparts, which further supports our hypothesis that migration negatively influences street children’s ability to use SRH services.

Our study shows that use of SRH services among street children regarding HIV testing services is generally low compared to the national overall figure especially for the out-of-school adolescents(46), which may imply that street children are not targeted for SRH and HIV interventions in Kampala city. Within the local context of the migration patterns and urban setting, the low uptake of SRH services among migrant street children could be explained by limited access to SRH information within the urban spaces where street children live, poor health worker attitude, unaffordability of the cost of care and language barrier especially among rural-urban migrant street children. Access could also be
compounded by seasonal return migration patterns as street children often go back to their districts of origin to remit financial support to the families left behind. Migration related factors may influence contraceptive use and unmet need for family planning in migrant communities(44)(43). Nevertheless, this finding contrasts sharply with the Kenya study in which rural-urban migrant women were more likely to use modern contraception than non-migrant rural women(45). In most countries, access to health services by the homeless populations living in cities is unaffordable and street children therefore rarely receive any healthcare for their ailments. Social marginalisation of street children mean that they remain excluded from such health care services(47). At the current annual population growth rate of 3.2%, the limited access and use of family planning services among urban migrant street adolescents could potentially result into increased fertility. Fertility among rural-urban migrants could be lowered if there they had no detachment with their families(48).

The increased use of SRH services among older street children compared to the young age group may imply that the older the street children are, the more likely to have stayed longer and adapted to the street environment and therefore having the ability to navigate the urban health care system with ease compared to their newcomer counterparts. Street life is a process that requires adaptation to the new street environment; therefore, the newcomers migrating from the rural areas may take some time to establish social and peer support networks that are critical for social support during healthcare seeking. As such, street children must dully navigate the challenges of migration while adapting to the new street culture, new language and socio-emotional culture (49)(50). Studies elsewhere have yielded similar results with limited access to health and reproductive care services reported among the urban rural youth, migrant sex workers and out-of-school adolescents(38)(51). Moreover, the observed association between access to sexual and reproductive health information and use of SRH services may imply interventions that deliver adolescent friendly SRH information could help promote SRH service uptake among street children. Innovative approaches such as door-to-door and peer-to-peer health education have been found to be effective in delivering SRH messages hard-to-reach populations in similar settings (52). Our finding is in line with previous studies that demonstrate the role of access to information in contraceptive use among young
people(53)(54), which further suggests that exposure to SRH information during the formative years may be influential in improving uptake of SRH services.

**Strengths & Limitations**

We were able to examine the predictors of uptake of sexual and reproductive health services among street children, adolescents and young people across a wide range of demographic factors including migration as the main predictor. The use of a large sample size with adequate power to detect the minimum meaningful difference in establishing a relationship between migration and uptake of SRH service is another strength. Our data are cross-sectional and therefore preclude our ability to determine the direction of causality. We did not control for sexual behaviours and street children’s household characteristics which might possibly confound the relationship between migration and SRH use. Owing to the large representative sample size and the methods used, we strongly believe that the findings of this study are valid and generalisable to all street children in Ugandan Cities.

**Conclusions**

In conclusion, rural-urban migration among street children in Kampala city, Uganda is associated with low SRH service uptake with rural-urban migrant street children being less likely to use SRH services than non-migrant street children. Other factors that influence use of SRH services among street children include age, schooling status, knowledge of place of care and access to SRH information. Implications for our study results point to the need for Ugandan urban health systems to design effective programs and interventions to address access barriers to equitable sexual and reproductive health services for the street children and other urban vulnerable young populations in Kampala City, and ultimately contribute to their improved reproductive health outcomes. Approaches such as mobile clinics and integrated outreach service models, correct SRH messaging in languages spoken by the migrant street children and improving health worker capacity to provide migrant responsive services can potentially increase SRH service uptake. Lastly, recognition of street children as key and vulnerable populations in national policies, plans and surveys including establishment a longitudinal database for urban populations by the national statistics department are critical for informing future research on street children mobility and reproductive health.
Abbreviations
aOR - Adjusted Odds Ratio
cOR – Crude Odds Ratio
HIV - Human Immunodeficiency Virus
FP – family planning
SRH – Sexual and reproductive health
STI - Sexually transmitted infections
RDS – Respondent Driven Sampling

Declarations

Competing Interests
The authors declare that they have no competing interests.

Availability of data and materials
The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Ethics approval and consent to participate
The study protocol and all study materials were reviewed and approved by the Maastricht University Faculty of Health Medicine and Life Sciences ethics committee (Ref. BvdB/Pvs/01001), Netherlands and Makerere University School of Social Sciences Research and Ethics Committee (Ref. MAKSS REC 12.18.389) and the Uganda National Council of Science and Technology (Ref. HS348ES). Permission to conduct the study in the selected areas will be sought from the Kampala Capital City Authority Directorate of Public Health and Environment (Ref. DPHE/KCCA/201/17). Informed written consent for publication of and participation in the study was obtained from the street children and/or their caregivers.

Authors’ contributions
MFB participated in the conception, design, implementation of the study, statistical analysis, interpretation and drafting of the manuscript. PB, CAM and BHWB participated in study conception, design, interpretation and drafting of the manuscript. All authors read, edited and approved the final
manuscript.

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References

1. Kanics, Jyothi, Senovilla Hernández, Daniel, Touzenis K. Migrating alone: unaccompanied and separated children’s migration to Europe [Internet]. 2010. 18–88 p. Available from: https://unesdoc.unesco.org/ark:/48223/pf0000190796

2. Mberu B, Mumah J, Kabiru C, Brinton J. Bringing Sexual and Reproductive Health in the Urban Contexts to the Forefront of the Development Agenda: The Case for Prioritizing the Urban Poor. Matern Child Health J. 2014;

3. Amin M, Maclachlan M, Mannan H, Tayeb S El, Khatim E, Swartz L, et al. groups in health policies Linked references are available on JSTOR for this article : EquiFrame : A framework for analysis of the inclusion of human rights and vulnerable groups in health policies. 2018;

4. Cumber SN, Tsoka-gwegweni JM. The health profile of street children in Africa : a literature review. 2015;6:85–90.

5. Wenzel S, Holloway I, Golinelli D, Ewing B, Bowman R, Tucker J. Social networks of homeless youth in emerging adulthood. Vol. 41, Journal of Youth and Adolescence. 2012. p. 561–71.

6. Habtamu D, Adamu A. Assessment of Sexual and Reproductive Health Status of Street Children in Addis Ababa. J Sex Transm Dis. 2013;2013:524076.

7. Maclel MR, Mello AF, Fossaluza V, Nobrega LP, Cividanes GC, Mari JJ, et al. Children
working on the streets in Brazil: Predictors of mental health problems. Eur Child Adolesc Psychiatry. 2013;

8. Cheney KE. “Village Life Is Better Than Town Life”: Identity, Migration, and Development in the Lives of Ugandan Child Citizens. Afr Stud Rev. 2004;

9. Taylor BS, Garduño LS, Reyes E V., Valiño R, Rojas R, Donastorg Y, et al. HIV care for geographically mobile populations. Mt Sinai J Med. 2011;

10. Jagger P, Shively G, Arinaitwe A. Circular migration, small-scale logging, and household livelihoods in Uganda. Popul Environ. 2012;

11. Ojeda VD, Burgos JL, Hiller SP, Lozada R, Rangel G, Vera A, et al. Circular migration by Mexican female sex workers who are injection drug users: Implications for HIV in Mexican sending communities. J Immigr Minor Heal. 2012;14(1):107–15.

12. N. T, A.M. F, T. S, F. N. Migrant and Refugee patient perspectives on travel and tuberculosis along the Thailand-Myanmar Border: A qualitative study. PLoS One. 2016;

13. Domnich A, Amicizia D, Panatto D, Signori A, Perelli V, Adamoli S, et al. Use of different subjective health indicators to assess health inequalities in an urban immigrant population in north-western Italy: A cross-sectional study. BMC Public Health. 2013;

14. Pison G, Guenno B Le, Lagarde E, Enel C, Seck C. Seasonal migration: A risk factor for hiv infection in rural senegal. J Acquir Immune Defic Syndr. 1993;

15. Zuma K, Gouws E, Williams B, Lurie M. Risk factors for HIV infection among women in Carletonville, South Africa: Migration, demography and sexually transmitted diseases. Int J STD AIDS. 2003;

16. Lurie MN, Williams BG, Zuma K, Mkaya-Mwamburi D, Garnett GP, Sturm AW, et al. The impact of migration on HIV-1 transmission in South Africa: A study of migrant and
nonmigrant men and their partners. Sex Transm Dis. 2003;

17. Almonte MT, Lynch CA. Impact of internal female migration on unmet need for modern contraception in Zambia. Reprod Health. 2019;

18. UNDESA. Youth Issue Briefs 2016: YOUTH AND MIGRATION. 2016.

19. World Economic Forum. Migration and Its Impact on Cities. 2017;(October):172. Available from: http://www3.weforum.org/docs/Migration_Impact_Cities_report_2017_low.pdf

20. IOM. Migration in Uganda Migration in Uganda A RAPID COUNTRY PROFILE 2013 International Organization for Migration Plot 6A Bukoto Crescent. Int Organ Migr [Internet]. 2015; Available from: http://uganda.iom.int/

21. MoH Uganda. Uganda Ministry of Health Health Sector Development Plan 2015/16 - 2019/20. 2015;(September 2015).

22. Glanz K, Rimer BK, Viswanath K. Health Behavior, Theory, Research and Practice (Fifth 5 Edition ). John Wiley & Sons; 2015.

23. Richard L, Potvin L, Kishchuk N, Prlic H, Green LW. Assessment of the integration of the ecological approach in health promotion programs. Am J Heal Promot. 1996;

24. Schneider M, Stokols D. Multilevel theories of behavior change: A social ecological framework. The handbook of health behavior change (3rd ed.). 2009.

25. Ostrom E, Janssen MA. Multi-level governance and resilience of social-ecological systems. In: Globalisation, Poverty and Conflict: A “Critical Development” Reader. 2005.

26. Nanos P, Schluter C. The composition of wage differentials between migrants and natives. Eur Econ Rev. 2014;

27. Kulu H. Migration and fertility: Competing hypotheses re-examined. European Journal of Population. 2005.
28. Myers GC and EWM. Migration and Fertility in Puerto Rico, Population Studies. J F Actions. 1966;20(1):85-96.
29. Biddlecom BM and AE. Migration, Sexual Behavior and the Risk of HIV in Kenya. Int Migr Rev. 1999;33(4):833-56.
30. Kulu H. “Migration and Fertility: Competing Hypotheses Re-examined,” Eur J Popul. 2005;21(1):51-87.
31. White, M. J., L. Moreno and SG. “The Interrelationship of Fertility and Migration in Peru: A Hazards Model Analysis,” Int Migr Rev. 1995;29:492-524.
32. Agnes Nakityo Bosa R, Baughman A, Lubwama G, Sande E, Kwezi RK, Hladik W. A capture-recapture exercise to estimate the population sizes of men who have sex with men and female sex workers in Kampala, Uganda. 20th Int AIDS Conf July 20-25, 2014, Melbourne, Aust. 2014;
33. MoFPED/UNPF. Transforming Uganda’s Economy: Opportunities to Harness the Demographic Dividend for Sustainable Development. State Uganda Popul Rep 2017. 2017;
34. IOM. 2012 prevalence of child migration from Karamoja’s Napak and Moroto Districts. IOM. 2014;
35. MoH. Health Sector Development Plan 2015/16 - 2019/20. RoU. 2015;
36. Uganda Bureau of Statistics (UBOS). Uganda bureau of statistics 2017 statistical abstract. Uganda Bur Stat. 2017;
37. Rothman KJ, Gallacher JEJ, Hatch EE. Why representativeness should be avoided. Int J Epidemiol. 2013;
38. Binu W, Marama T, Gerbaba M, Sinaga M. Sexual and reproductive health services utilization and associated factors among secondary school students in Nekemte town, Ethiopia. Reprod Health. 2018;
39. Hall KS, Moreau C, Trussell J. Lower use of sexual and reproductive health services among women with frequent religious participation, regardless of sexual experience. J Women’s Heal. 2012;

40. Olawore O, Tobian AAR, Kagaayi J, Bazaale JM, Nantume B, Kigozi G, et al. Migration and risk of HIV acquisition in Rakai, Uganda: a population-based cohort study. Lancet HIV. 2018;

41. Embleton L, Wachira J, Kamanda A, Naanyu V, Winston S, Ayuku D, et al. “Once you join the streets you will have to do it”: sexual practices of street children and youth in Uasin Gishu County, Kenya. Reprod Health [Internet]. 2015;12(1):106. Available from: http://reproductive-health-journal.biomedcentral.com/articles/10.1186/s12978-015-0090-z

42. Ababor AA, Tesso DW, Cheme MC. Addressing the deprived: need and access of sexual reproductive health services to street adolescents in Ethiopia. The case of Nekemte town: mixed methods study. BMC Res Notes [Internet]. 2019;12(1):827. Available from: https://doi.org/10.1186/s13104-019-4850-7

43. Kessler K, Goldenberg S, Quezada L. Contraceptive Use, Unmet Need for Contraception, and Unintended Pregnancy in a Context of Mexico-U.S. Migration. F Actions Sci Reports J F actions. 2010;

44. Ochako R, Askew I, Okal J, Oucho J, Temmerman M. Modern contraceptive use among migrant and non-migrant women in Kenya. Reprod Health [Internet]. 2016;1-8. Available from: http://dx.doi.org/10.1186/s12978-016-0183-3

45. UBOS-UDHS. Uganda Demographic and Health Survey 2016. Udhs 2016. 2016;

46. Cumber SN, Tsoka-Gwegweni J. The health profile of street children in africa: A literature review. Vol. 6, Journal of Public Health in Africa. Page Press Publications; 2016.
47. Yang X. The fertility impact of temporary migration in China: A detachment hypothesis. Eur J Popul. 2000;

48. Myburgh C, Moolla A, Poggenpoel M. The lived experiences of children living on the streets of Hillbrow. Curationis. 2015 May 22;38(1).

49. Lara D, Decker MJ, Brindis CD. Exploring how residential mobility and migration influences teenage pregnancy in five rural communities in California: youth and adult perceptions. Cult Heal Sex. 2016;

50. Goldenberg SM, Chettiar J, Nguyen P, Dobrer S, Montaner J, Shannon K. Complexities of short-term mobility for sex work and migration among sex workers: Violence and sexual risks, barriers to care, and enhanced social and economic opportunities. J Urban Heal. 2014;

51. Ndejjo R, Musinguzi G, Nuwaha F, Wanyenze RK, Bastiaens H. Acceptability of a community cardiovascular disease prevention programme in Mukono and Buikwe districts in Uganda: a qualitative study. 2020;1-15.

52. Denno DM, Hoopes AJ, Chandra-Mouli V. Effective strategies to provide adolescent sexual and reproductive health services and to increase demand and community support. Journal of Adolescent Health. 2015.

53. Phiri M, King R, Newell JN. Behaviour change techniques and contraceptive use in low and middle income countries: A review. Reproductive Health. 2015.

Tables
Table 1: Background characteristics of street children by migration status, Kampala City, Uganda, 2019
| Characteristic                        | Migrant (%) (n=284) | Non-migrant (%) (n=229) | Total (%) (N=513) |
|--------------------------------------|---------------------|-------------------------|------------------|
| **Age (in years)** **                |                     |                         |                  |
| 12-14                                | 12.32               | 9.61                    | 11.11            |
| 15-17                                | 32.39               | 20.09                   | 26.90            |
| 18-20                                | 34.86               | 34.93                   | 34.89            |
| 21-24                                | 20.42               | 35.37                   | 27.10            |
| **Sex **                             |                     |                         |                  |
| Male                                 | 47.89               | 72.93                   | 59.06            |
| Female                               | 52.11               | 27.07                   | 40.94            |
| **Schooling status** **              |                     |                         |                  |
| Out of school                        | 93.66               | 89.72                   | 89.67            |
| In school                            | 6.34                | 15.28                   | 10.33            |
| **Highest Education attained** **    |                     |                         |                  |
| Primary                              | 76.50               | 58.57                   | 67.68            |
| Secondary                            | 23.04               | 39.52                   | 31.15            |
| Tertiary                             | 0.46                | 1.90                    | 1.17             |
| **Marital Status ** **               |                     |                         |                  |
| Married/living with a partner        | 21.48               | 10.92                   | 16.76            |
| Not Married                          | 77.11               | 82.53                   | 79.53            |
| Divorced/separated/widowed           | 1.41                | 6.55                    | 3.70             |
| **Living arrangement ** **          |                     |                         |                  |
| Stays alone                          | 11.97               | 12.23                   | 12.09            |
| Stays with parents                   | 3.51                | 20.09                   | 10.15            |
| Stays with friends/partner           | 60.91               | 49.78                   | 54.97            |
| Stays with siblings/other            | 21.12               | 17.90                   | 19.69            |
| **Daily income earned (USD)** **     |                     |                         |                  |
| <1 USD                               | 40.47               | 20.77                   | 32.27            |
| ≥1 USD                               | 59.53               | 79.23                   | 67.73            |
| **Orphanhood status** **            |                     |                         |                  |
| Orphaned child                       | 46.83               | 53.71                   | 49.90            |
| Non-orphaned child                   | 53.17               | 46.29                   | 50.10            |

### Prevalence of SRH service utilisation

| Service                                    | Migrant (%) (n=284) | Non-migrant (%) (n=229) | Total (%) (N=513) |
|--------------------------------------------|---------------------|-------------------------|------------------|
| HIV testing & know status in the past 12 months ** |                     |                         |                  |
| No                                        | 137(48.24)          | 75(32.75)               | 212              |
| Yes                                       | 147(51.76)          | 154(67.25)              | 301              |
| Ever used modern family planning method ** |                     |                         |                  |
| No                                        | 243(85.56)          | 177(77.29)              | 420              |
| Yes                                       | 41(14.44)           | 52(22.71)               | 93(              |
| Screened/tested for STI in the past 12 months ** |                     |                         |                  |
| No                                        | 209(73.59)          | 126(55.02)              | 335              |
| Yes                                       | 75(26.41)           | 103(44.98)              | 178              |
| Knows place of care for SRH services ** |                     |                         |                  |
| No                                        | 158(55.63)          | 99(43.23)               | 257              |
| Yes                                       | 126(44.37)          | 130(56.77)              | 256              |
| Ever used either of the three SRH services (HIV test, STI screening & FP) ** |                     |                         |                  |
| No                                        | 127(44.72)          | 68(29.69)               | 195              |
| Yes                                       | 157(55.28)          | 161(70.31)              | 318              |
| Used all the three SRHR services (HIV test, STI screening & FP) |                     |                         |                  |
| No                                        | 258(90.85)          | 196(85.59)              | 454              |
| Yes                                       | 26(9.15)            | 33(14.41)               | 59               |

** Significant at the 5% p-value.

Table 2: Bivariate analysis of selected predictors and migration aspects with SRH service uptake among street children in Kampala City, Uganda, 2019
| Characteristic                              | Never used n (%) | Ever used n (%) | cOR (95% CI) |
|--------------------------------------------|------------------|----------------|-------------|
| **Sex (N=513)**                            |                  |                |             |
| Male                                       | 110 (56.41)      | 193 (60.69)    | 1           |
| Female                                     | 85 (43.59)       | 125 (39.31)    | 0.84 (0.58-1.20) |
| **Age in years**                           |                  |                |             |
| 12-17                                      | 123 (63.08)      | 72 (22.64)     | 1           |
| 19-24                                      | 72 (36.92)       | 246 (77.36)    | 5.84 (3.95-8.64) |
| **Marital Status**                         |                  |                |             |
| Not married                                | 176 (90.26)      | 251 (78.93)    | 1           |
| Married                                    | 19 (9.74)        | 67 (21.07)     | 2.47 (1.43-4.26) |
| **Perceived residence status**             |                  |                |             |
| Mobile/seasonal                            | 137 (70.26)      | 175 (55.03)    | 1           |
| Permanent                                  | 58 (29.74)       | 143 (44.97)    | 1.93 (1.32-2.81) |
| **Highest education attained**             |                  |                |             |
| Primary                                    | 121 (80.67)      | 168 (60.65)    | 1           |
| Secondary + Tertiary                       | 29 (19.33)       | 109 (39.35)    | 2.71 (1.69-4.34) |
| **Schooling status**                       |                  |                |             |
| Out of school                              | 164 (84.10)      | 296 (93.08)    | 1           |
| In school                                  | 31 (15.90)       | 22 (6.92)      | 0.39 (0.22-0.70) |
| **Daily income earned**                    |                  |                |             |
| Less than 1 USD                            | 65 (38.92)       | 77 (28.21)     | 1           |
| 1 USD and above                            | 102 (61.08)      | 196 (71.79)    | 1.62 (1.08-2.44) |
| **Migration status**                       |                  |                |             |
| Non-Migrant                                | 68 (34.87)       | 161 (50.63)    | 1           |
| Migrant                                    | 127 (65.13)      | 157 (49.37)    | 0.52 (0.36-0.74) |
| **Duration of stay in the city**           |                  |                |             |
| More than 2 years                          | 48 (27.43)       | 93 (37.20)     | 1           |
| Stayed up to 2 years                       | 127 (72.57)      | 127 (62.80)    | 0.64 (0.42-0.97) |
| **Residential mobility**                   |                  |                |             |
| 1 place                                    | 99 (56.57)       | 95 (38.00)     | 1           |
| 2 or more places                           | 76 (43.43)       | 155 (62.00)    | 2.13 (1.43-3.15) |
| **Place of origin/birth**                  |                  |                |             |
| Outside Kampala district                   | 175 (89.74)      | 250 (78.62)    | 1           |
| Kampala district                           | 20 (10.26)       | 68 (21.38)     | 2.38 (1.48-4.06) |
| **Region of birth**                        |                  |                |             |
| Other regions                              | 126 (64.62)      | 171 (53.77)    | 1           |
| Central region                             | 68 (35.38)       | 147 (46.23)    | 1.57 (1.09-2.27) |
| **District of birth/origin**               |                  |                |             |
| Born outside Kampala                       | 175 (89.74)      | 250 (78.62)    | 1           |
| Born in Kampala                            | 20 (10.26)       | 68 (21.38)     | 2.38 (1.39-4.02) |
| **Ethnicity (tribe)**                      |                  |                |             |
| Other tribes                               | 113 (57.95)      | 226 (71.07)    | 1           |
| Ngakarimajong                              | 82 (42.05)       | 92 (28.93)     | 0.56 (0.37-0.82) |
| **Circular movement**                      |                  |                |             |
| Non-circular migrant                       | 94 (74.02)       | 112 (71.34)    | 1           |
| Circular migrant                           | 33 (25.98)       | 45 (28.66)     | 1.14 (0.68-1.94) |

**Significant at the 5% p-value.**

Table 3: Multivariate analysis of demographic and migration variables with SRH service uptake among street children in Kampala City, Uganda, 2019
| Predictor variable                                      | Coef  | St.Err. | t-value | p-value | [95% Confident Interval] |
|---------------------------------------------------------|-------|---------|---------|---------|-------------------------|
| Migration status (0=non migrant, 1=migrant)             | 0.584 | 0.150   | -2.09   | 0.037   | 0.353 - 0.803           |
| Age (0=<18yrs, 1=18yrs & above)                         | 4.507 | 1.119   | 6.06    | 0.000   | 2.770 - 7.250           |
| Gender (0=male, 1=female)                               | 0.734 | 0.219   | -1.03   | 0.301   | 0.409 - 1.064           |
| Schooling status (0=not in school, 1=in school)         | 0.341 | 0.140   | -2.61   | 0.009   | 0.152 - 0.529           |
| Parenthood status (0=non orphan)                        | 1.039 | 0.249   | 0.16    | 0.873   | 0.650 - 1.422           |
| Daily income in USD (0=<1USD, 1=>1USD)                  | 1.212 | 0.320   | 0.73    | 0.466   | 0.723 - 1.711           |
| Religion (0=Non-Christian, 1=Christian)                 | 1.033 | 0.314   | 0.21    | 0.814   | 0.570 - 1.492           |
| Marital status (0=Not married, 1=married)               | 1.603 | 0.626   | 1.21    | 0.227   | 0.745 - 2.469           |
| Access to SRH education materials in past 6 months (0=no, 1=yes) | 2.753 | 0.699   | 4.88    | 0.000   | 2.044 - 3.467           |
| Knows of a place to go to for FP services (0=no, 1=yes) | 3.305 | 0.810   | 4.48    | 0.000   | 2.108 - 4.502           |
| Constant                                                | 0.376 | 0.160   | -2.29   | 0.022   | 0.163 - 0.587           |

Mean dependent var: 0.620
SD dependent var: 0.240
Chi-square: 140.243
Prob > chi2: 0.000
Akaike crit. (AIC): 465.937
Bayesian crit. (BIC): 510.892

*** p<0.01, ** p<0.05, * p<0.1

Figures

Figure 1

Conceptual framework of the migration aspects and other independent factors associated with uptake of SRH services among street children, Kampala city, Uganda, 2019.
