



**RESEARCH SUMMARY**  
**July – October 2019**

**NEWSLETTER**  
**November 2019**

Below is a selection of abstracts related to children, HIV and AIDS published in peer-reviewed journals between July and October 2019. The topics in this issue of the research summary are: (1) [HIV in pregnancy and breastfeeding](#), (2) [HIV prevention](#), (3) [HIV testing and diagnostics](#), (4) [paediatric HIV treatment](#), (5) [HIV service delivery for adolescents and young people](#) and (6) [HIV epidemic among adolescent girls and young women](#).

The abstracts below are as published. Where abstracts were edited, it was for consistency of style and length.

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### **Topic I: HIV in pregnancy and breastfeeding**

[Shamu, S., et al., 'HIV status disclosure patterns and male partner reactions among pregnant women with HIV on lifelong ART in Western Kenya', \*PLoS One\*, vol. 14 \(9\), 6 September 2019. doi: 10.1371/journal.pone.0221215.](#)

- To understand how disclosure of HIV status to sexual partners contributes to improved prevention of mother-to-child transmission (PMTCT) outcomes, the researchers conducted a survey in Western Kenya among 200 women enrolled in a large study of PMTCT during pregnancy.
- Results from the questionnaire, administered at 12 months post-partum, were analysed for disclosure patterns and factors associated with male partner reactions.
- Among the 180 women who reported having a male partner, 95.5 per cent reported disclosing their HIV status to that partner. Most women (82.8 per cent) reported that disclosure occurred within one year of their diagnosis, with 62.7 per cent of disclosures occurring within one week. The most common forms of disclosure were: self-disclosure

(55.4 per cent), disclosure during the couple's HIV testing and counselling (31.5 per cent) or disclosure at an antenatal care visit (7.7 per cent).

- Most (87.5 per cent) of the women reported that male partner reactions to their HIV status disclosure were positive. Those with negative reactions reported their partners were confused, were annoyed or threatened to leave. However, there were no reports of intimate partner violence or ended relationships.
- While the small sample size limited analysis of the types of disclosure patterns, disclosure via the couple's HIV testing and counselling in this cohort was associated with a positive male partner reaction compared to individual disclosure (adjusted odds ratio [aOR] 20.2, 95 per cent confidence interval [95% CI] 1.8–221.4). Those in concordant HIV-status partnerships were more likely to have a positive reaction (aOR. 6.7, 95% CI 1.7–26.6), and women experiencing frequent verbal partner violence were less likely to report a positive response (aOR 0.21, 95% CI 0.1–0.8).

[Fairlie, L., et al., 'Inclusion of pregnant women in antiretroviral drug research: what is needed to move forwards?', \*Journal of the International AIDS Society\*, vol. 22 \(9\), 16 September 2019. doi:10.1002/jia2.25372.](#)

- The authors of this commentary urge a formalized approach to including pregnant women in antiretroviral drug research. "To adequately ascertain drug safety and efficacy, drug trials need to include participants from all groups likely to receive the medication following approval," they write. "Pregnant women, however, are mostly excluded from trials, and women participating are often required to use highly effective contraception and taken off study product if they conceive."
- The article focuses on antiretrovirals and recommends an approach to understand pregnancy risk profiles of medicines by systematically stratifying the clinical trial population. The authors note that this can be done through research with non-pregnant women, opportunistic studies among women who become pregnant during a clinical trial or within routine clinical treatment, clinical trials with pregnant women concurrent with phase II/III trials in non-pregnant adults or surveillance for outcomes in pregnant women and their infants.
- Each step can be enabled by clear criteria from international and local regulatory bodies on progression through study phases, standardized protocols for collecting relevant data, collaborative data sharing, pregnancy outcomes surveillance systems supported by committed funding.

[Wedderburn, C.J., et al. 'Neurodevelopment of HIV-exposed uninfected children in South Africa: outcomes from an observational birth cohort study', \*The Lancet Child & Adolescent Health\*, vol. 3 \(11\), November 2019. doi:10.1016/S2352-4642\(19\)30250-0](#)

- HIV infection is known to cause child developmental delay but the effects of HIV exposure on child development in children uninfected are unclear. The researchers of this birth cohort study compared the neurodevelopmental outcomes of HIV-exposed uninfected and HIV-unexposed children during the first two years of life through community-based clinics in Paarl, South Africa.
- Developmental assessments on the Bayley Scales of Infant and Toddler Development, third edition (BSID-III), were done in 260 randomly selected children (61 HIV-exposed uninfected, 199 HIV-unexposed) at 6 months and in 732 children (168 HIV-exposed uninfected, 564 HIV-unexposed) at 24 months. All HIV-exposed uninfected children were exposed to maternal antiretroviral therapy (ART).
- BSID-III outcomes did not significantly differ between HIV-exposed uninfected and HIV-unexposed children at 6 months. At 24 months, HIV-exposed uninfected children scored

lower than HIV-unexposed children for receptive language and expressive language, but differences between the two groups in cognitive, fine motor and gross motor domain scores were not significant. The proportions of HIV-exposed uninfected children with developmental delays were higher than those of HIV-unexposed children for receptive language (aOR 1.96, 95% CI 1.09–3.52) and expressive language (aOR 2.14, 95% CI 1.11–4.15).

- Uninfected children exposed to maternal HIV infection and maternal ART in this cohort had increased odds of receptive and expressive language delays at two years of age. Further long-term work is needed to understand developmental outcomes of HIV-exposed uninfected children.

[Shava, E., et al., 'Brief Report: High Rates of Adverse Birth Outcomes in HIV and Syphilis Coinfected Women in Botswana', \*Journal of Acquired Immune Deficiency Syndromes\*, vol. 81 \(5\), 15 August 2019. doi: 10.1097/QAI.0000000000002082.](#)

- This study aimed to understand the combined impact of HIV and syphilis on birth outcomes among pregnant women in Botswana. Of the 76,466 women enrolled in the study, 27 per cent (20,520) were HIV-positive and 1 per cent (697) had a positive syphilis test, including 261 women who were coinfecting. Outcomes studied included stillbirth, preterm delivery, low birth weight and in-hospital neonatal death.
- Stillbirth occurred in 5.8 per cent of coinfecting women, compared with 1.9 per cent of those with neither HIV or syphilis, 3.4 per cent of women with HIV alone and 3.7 per cent of women with syphilis alone. Low birth weight occurred in 24.1 per cent of coinfecting women, compared with 12.1 per cent of women with neither infection, 20 per cent of those with HIV alone and 14.6 per cent of women with syphilis alone.
- Notably, through the study period from 2008 to 2016, the proportion of women with syphilis remained constant at around 1 per cent but HIV-syphilis coinfection declined from 45 to 27 per cent.

[Goga, A.E., et al., 'What will it take for the Global Plan priority countries in Sub-Saharan Africa to eliminate mother-to-child transmission of HIV?', \*BMC Infect Diseases\*, vol. 19 \(1\), 16 September 2019. doi: 10.1186/s12879-019-4393-5.](#)

- This paper synthesizes the characteristics of the first four countries validated for the elimination of mother-to-child transmission of HIV (EMTCT) and the 21 Global Plan priority countries located in sub-Saharan Africa. The researchers considered what drives MTCT in the 21 Global Plan priority countries in sub-Saharan Africa.
- A literature review was conducted to obtain global- and national-level information on current HIV-related contexts and health system characteristics of the first four EMTCT-validated countries and the 21 priority countries. Additionally, key global experts working on EMTCT were contacted to obtain clarification on published data.
- The researchers applied three theories to understand and explain the differences between EMTCT-validated and non-validated countries. Structural equation modelling and linear regression were used to explain associations between infant HIV exposure, access to ART and two outcomes: (1) rate of MTCT and (2) number of new paediatric HIV infections per 100,000 live births (paediatric HIV case rate).
- Overall, EMTCT-validated countries had lower HIV prevalence, lower rates of breastfeeding and fewer challenges around leadership, governance within the health sector or country, infrastructure and service delivery compared with the Global Plan priority countries. Although by 2016 EMTCT-validated countries and Global Plan priority countries had adopted recommendations for lifelong ART for all pregnant and breastfeeding women with HIV, EMTCT-validated countries had also included contact

tracing with assisted partner notification and integrated maternal and child health (MCH) and sexual and reproductive health (SRH) services with HIV services. The analysis also showed that the Global Plan priority countries have limited data on key SRH indicators.

- Structural equation modelling and linear regression analysis demonstrated that ART access protects against MTCT; the model included ART access as a mediator in the relationship between the number of HIV-exposed infants and the rate of MTCT. In the modelling, the paediatric HIV case rate was driven by the number of HIV-exposed infants. In the linear regression, ART access alone explains 17 per cent of the case rate while the number of HIV-exposed infants alone explains 81 per cent of the case rate.

[Igumbor, J.O., et al., 'Effect of a Mentor Mother Programme on retention of mother-baby pairs in HIV care: A secondary analysis of programme data in Uganda', \*PLoS One\*, vol. 14 \(10\), 14 October 2019. doi: 10.1371/journal.pone.0223332.](#)

- Community health workers (CHWs) play an important role in promoting retention in HIV treatment and care, and CHW programmes are known to have a positive effect on retention of mother-baby pairs in HIV care in sub-Saharan Africa, notwithstanding inconsistencies in the outcomes of such programmes. The aim of this analysis was to assess the effect of a mothers2mothers (m2m) programme in Uganda that supported mentor mothers on the retention of mother-infant pairs in HIV treatment and care.
- The researchers conducted a secondary analysis of data obtained from the m2m programme in nine East Central districts. Some 1,161 women who were enrolled at PMTCT sites with the 'mentor mothers' intervention were compared with 1,143 women who received standard PMTCT services without the intervention.
- Retention in the PMTCT cascade was significantly higher for mother-baby pairs in the intervention arm compared to those in the control arm across all measured time points (96.7 per cent vs. 65.8 per cent at 6 weeks after birth; 81.5 per cent vs. 42 per cent at 6 weeks after cessation of breastfeeding; and 71.2 per cent vs. 20.6 per cent at 18 months after birth). Relative to the control group, women in the intervention group were less likely to be lost to follow up (aOR 0.05, 95% CI 0.02–0.15). There was no difference in the proportion of the retained mother-baby pairs who received prescribed PMTCT interventions at different time points, but a significantly higher number of mother-baby pairs in the intervention arm were retained at different time points.
- HIV-positive mothers and their HIV-exposed children in the m2m programme in this setting had higher retention in HIV care at every step along the PMTCT cascade. The researchers cite this analysis to recommend further adoption of peer-to-peer models in sub-Saharan Africa complementary to strategies to retain women in care and other health system interventions.

## Topic II: HIV prevention

[Baral, S., et al., 'The disconnect between individual-level and population-level HIV prevention benefits of antiretroviral treatment', \*The Lancet HIV\*, vol. 6 \(9\), 1 September 2019. doi: 10.1016/S2352-3018\(19\)30226-7.](#)

- In this commentary, the authors note that while treatment as prevention is often heralded as the path to improve HIV outcomes and reduce HIV incidence, scaling up treatment in sub-Saharan Africa has had less than the expected impact on reducing HIV incidence according to population-level observational and experimental data.
- Treatment of an individual does eliminate onward transmission to sero-discordant partners; people living with HIV who achieve and maintain an undetectable viral load by taking antiretroviral therapy (ART) daily as prescribed cannot sexually transmit the virus

to others. However, the prevention results at the population-level are more modest. The authors note that this disconnect might be the result of little attention given to heterogeneities of HIV acquisition and transmission risks that exist in people at risk of and living with HIV, even in the most broadly generalized epidemics.

- According to the authors, available data suggest that “HIV treatment is treatment, HIV prevention is prevention” and the specificity of HIV treatment approaches towards people at highest risk of onward transmission drives the intersection between the two.
- To optimize the potential HIV prevention effects of universal testing and treatment approaches, the authors recommend placing more attention on who is being supported with treatment, rather than focusing only on the targets for how many individuals are reached, and prioritizing populations with a disproportionate burden of HIV risk.

[Taggart, T., et al., 'Getting youth PrEPared: adolescent consent laws and implications for the availability of PrEP among youth in countries outside of the United States', \*Journal of the International AIDS Society\*, vol. 22 \(7\), 1 August 2019. doi: 10.1002/jia2.25363.](#)

- While pre-exposure prophylaxis (PrEP) has the potential to curb new infections among adolescents and young people, it is unclear how country-specific laws and policies governing youth access to SRH services impact access to PrEP. The purpose of this review was to analyse laws and policies concerning PrEP implementation and SRH services available to youth in countries with a high HIV incidence.
- The researchers conducted a review of national policies that could impact adolescents' access to PrEP and SRH services and their ability to consent to medical intervention. Countries were included if: (1) there was a high incidence of HIV; (2) they had active PrEP trials or PrEP was available for distribution; and (3) information regarding PrEP guidelines was publicly available. The researchers also included a selected number of countries with lower HIV incidence among adolescents.
- Fifteen countries were selected for inclusion in the review, the majority in Eastern and Southern Africa and South Asia. Countries varied considerably in their laws and policies governing adolescents' access to PrEP, HIV testing and SRH services. Six countries had specific policies around the provision of PrEP to those under the age of 18. Five countries required people to be 18 years or older to access HIV testing, and six countries had specific laws addressing adolescent consent for and access to contraceptives.
- The researchers note that adolescents' access to PrEP without parental consent remains limited or uncertain in many countries where this biomedical intervention is needed. Observational and qualitative studies are needed to determine if and how consent laws are followed in relation to providing PrEP to adolescents.

[Roberts, D.A., et al., 'The role of costing in the introduction and scale-up of HIV pre-exposure prophylaxis: evidence from integrating PrEP into routine maternal and child health and family planning clinics in western Kenya', \*Journal of the International AIDS Society\*, vol. 22 \(S4\), 22 July 2019. doi: 10.1002/jia2.25296.](#)

- Providing PrEP through MCH and family planning clinics offers a promising strategy to reach women in settings with high prevalence of HIV. This analysis estimated incremental costs and explored the cost drivers of integrating PrEP delivery into routine MCH and family planning services in Kenya.
- A costing study was conducted from the provider perspective within a PrEP implementation programme for adolescents and young women in Western Kenya. In addition to assessing input costs, the researchers estimated changes in costs if creatinine blood testing were postponed from the time of PrEP initiation to the first

follow-up visit and if PrEP were prioritized to clients at high HIV risk using a behavioural risk assessment tool. They also projected costs under Ministry of Health implementation assuming salaries and programme supervision and estimated annual numbers of PrEP visits from programme data from 16 facilities between November 2017 and June 2018.

- For an annual programme output of 24,005 screenings, 4,198 PrEP initiations and 4,427 follow-up visits, the average cost per client-month of PrEP dispensed in the study was US\$26.52. Personnel, drugs and laboratory tests comprised 43 per cent, 25 per cent and 14 per cent of programme costs, respectively. Postponing creatinine testing and prioritizing PrEP delivery to clients at high HIV risk reduced total programme costs by 8 per cent and 14 per cent, respectively. In the Ministry of Health scenario assuming no changes in outputs, the projected cost per client-month of PrEP dispensed decreased to US\$16.54 and total programme costs decreased by 38 per cent.
- The paper concludes that incremental PrEP costs are sensitive to the service delivery strategy used to engage priority populations. Postponing creatinine testing and prioritizing PrEP delivery to clients with higher risks of HIV acquisition may reduce costs.

[Eakle, R., et al., 'Understanding user perspectives of and preferences for oral PrEP for HIV prevention in the context of intervention scale-up: a synthesis of evidence from sub-Saharan Africa', \*Journal of the International AIDS Society\*, vol. 22 \(S4\), 22 July 2019. doi: 10.1002/jia2.25306.](#)

- To inform PrEP interventions and demand creation, this paper examines individuals' perspectives on adopting and using PrEP among different populations at risk of HIV in sub-Saharan Africa.
- The researchers examined the extent, range and nature of available evidence regarding PrEP uptake and use among the following populations: men who have sex with men, HIV sero-discordant couples, adolescent girls and young women, pregnant and breastfeeding women, women partners of migrant workers and people who use drugs. Thirty-five papers were included in this review.
- Overall, there was little opposition to oral PrEP in these populations. However, there were significant nuances in its broader acceptability, applicability and usability. The researchers identified five themes within which these are discussed: (1) balancing complexities of personal empowerment and stigma; (2) navigating complex risk environments; (3) influences of relationships and partners; (4) efficacy and side effects; and (5) practicalities of use.
- The researchers suggest that while product attributes and the logistics of PrEP delivery and use are important topics, it is vital to consider stigma, the interactions of PrEP use with relationships, and the need for broader understanding of ART for prevention versus treatment.

[Moorhouse, L., et al., 'Application of the HIV prevention cascade to identify, develop and evaluate interventions to improve use of prevention methods: examples from a study in east Zimbabwe', \*Journal of the International AIDS Society\*, vol. 22 \(S4\), 22 July 2019. doi: 10.1002/jia2.25309.](#)

- This paper proposes a standardized approach to using the HIV prevention cascade to guide identification and evaluation of prevention-focused interventions and demonstrate its feasibility for this purpose. It does so through an example of a project to develop interventions to improve the use of HIV prevention methods by adolescent girls and young women and male partners in eastern Zimbabwe.
- The proposed approach includes the following steps: (1) measure the HIV prevention cascade for the chosen population and method; (2) identify gaps in the cascade; (3)

identify explanatory factors or barriers contributing to observed gaps; (4) review literature to identify relevant theoretical frameworks and interventions; (5) tailor interventions to the local context; and (6) implement and evaluate the interventions using the cascade steps and explanatory factors as outcome indicators in the evaluation design.

- In Zimbabwe, the first five steps aided the development of four interventions to overcome barriers for the effective usage of PrEP among adolescent girls and young women (aged 15–24 years) and voluntary medical male circumcision in male partners (aged 15–29 years).
- For young men, the analysis identified gaps in motivation and access as barriers to the uptake of voluntary medical male circumcision; the intervention designed to address these gaps include financial incentives and an education session. For younger women, gaps in motivation, including the lack of risk perception, and lack of access were identified as barriers to PrEP uptake. An interactive counselling game and a text messaging intervention were developed to address these barriers. At the same time, a community-led intervention was developed to address community-level factors underlying gaps in motivation, access and effective use. These interventions are currently being evaluated using outcomes from the HIV prevention cascade.

### Topic III: HIV testing and diagnostics

[Anaba, U.C., et al. 'Missed opportunities for early infant diagnosis of HIV in rural North-Central Nigeria: A cascade analysis from the INSPIRE MoMent study', \*PLoS One\*, vol. 14 \(7\), 31 July 2019. doi: 10.1371/journal.pone.0220616.](#)

- Early identification of HIV-infected infants for treatment is critical for survival. Efficient uptake of early infant diagnosis (EID) requires timely presentation of HIV-exposed infants, same-day sample collection and prompt release of results. The Mother Mentor (MoMent) study in Nigeria investigated the impact of structured peer support on EID presentation and maternal retention. This cascade analysis highlights missed opportunities for EID and infant treatment initiation during the study.
- Pregnant women living with HIV and their infants were recruited at 20 rural primary health centres. Routine infant HIV testing was performed at centralized laboratories using dried blood spot samples ideally collected by two months of age. EID outcome data were abstracted from case report forms and facility registers.
- Out of 497 women enrolled, delivery data were available for 445 women (90.8 per cent), to whom 415 of 455 (91.2 per cent) infants were live-born. Among the infants with available data, 341 (83.6 per cent) presented for dried blood spot sampling at least once. Only 257 (75.4 per cent) were sampled, including 210 who were sampled at first presentation. Among these sampled infants, 199 (77.4 per cent) had results available up to 28 months post-collection. Two infants (1.0 per cent) tested HIV-positive; one of them died before treatment initiation and the other was lost to follow-up.
- While nearly 85 per cent of infants presented for sampling, there were multiple missed opportunities. The researchers note that this was largely due to health system gaps and not necessarily patient-level failures, including infants presenting without being sampled, presenting multiple times before samples were collected and not receiving results after testing. Neither of the two HIV-positive infants were linked to treatment within the follow-up period. The researchers urge for quality improvement approaches to be optimized for EID availability, consistent dried blood spot sample collection, efficient processing and release of results, and prompt infant treatment initiation.

[Nicholas, S., et al., 'Point-of-care viral load monitoring: outcomes from a decentralized HIV programme in Malawi', \*Journal of the International AIDS Society\*, vol. 22, 23 August 2019, doi:10.1002/jia2.25387](#)

- Routinely monitoring the HIV viral load of people living with HIV and on ART facilitates intensive adherence counselling and faster switch of ART regimens when treatment failure is indicated. Yet standard viral load testing in centralized laboratories can be time-intensive and logistically difficult in low-resource settings. This paper evaluates the outcomes of the first four years of routine viral load monitoring using point-of-care technology, implemented by Médecins Sans Frontières (MSF) in rural clinics in Malawi.
- The researchers conducted a retrospective cohort analysis of patients eligible for routine viral load testing between 2013 and 2017 in four decentralized ART clinics and the district hospital in Chiradzulu, Malawi. Viral load testing coverage and the treatment failure cascade (from suspected failure to viral load suppression after regimen switch) were assessed.
- Among 21,400 eligible patients, coverage of viral load testing was at 85 per cent and viral load suppression was found in 89 per cent of those tested. In the decentralized clinics, 88 per cent of test results were reviewed on the same day as blood collection, whereas in the district hospital the median turnaround time for results was 85 days. Among 1,544 first-line ART patients with suspected failure, 30 per cent were suppressed (viral load less than 1,000 copies/mL), 35 per cent were treatment failures and 35 per cent had incomplete viral load follow-up. Among treatment failures, 540 (80 per cent) were switched to a second-line regimen, with a higher switch rate in the decentralized clinics than in the district hospital (86 per cent vs. 67 per cent) and a shorter median time-to-switch (6.8 months vs. 9.7 months). Similarly, the post-switch viral load testing rate was markedly higher in the decentralized clinics (61 per cent vs. 26 per cent). Overall, 79 per cent of patients with a post-switch viral load test were suppressed.
- Point-of-care viral load testing at the Chiradzulu district hospital achieved high coverage, and for those identified as treatment failures, good drug regimen switch rates. In decentralized clinics, same-day test results and shorter time-to-switch illustrated the game-changing potential of point-of-care-based viral load testing. The researchers noted that gaps were identified along all steps of the failure cascade; regular staff training, continuous monitoring and demand creation are needed for the success of routine viral load testing.

[Tembo, T.A., et al., 'Enhancing an HIV index case testing passive referral model through a behavioural skills-building training for healthcare providers: a pre-/post-assessment in Mangochi District, Malawi', \*Journal of the International AIDS Society\*, vol. 22 \(S3\), 19 July 2019. doi: 10.1002/jia2.25292.](#)

- More than one quarter of HIV-positive Malawians remain unaware of their HIV status. Testing the sexual partners, guardians and children of individuals living with HIV – an approach known as index case finding – helps reach more individuals who are unaware of their HIV status. Index case finding can be passive, where the HIV-positive individual (index) invites a contact for HIV testing, or active, where a health provider assists the index with partner notification and offers HIV testing to the partner. This study describes the impact of a behavioural skills-building training for healthcare workers (HCW) in support of implementing Malawi's passive index case finding programme.
- In 2017, HCWs from 36 health facilities in Mangochi were trained for the index case finding programme and began implementation. In 2018, a total of 573 HCWs from these

facilities received further training. The training focused on identifying untested sexual partners and better equipping individuals who were indexes to issue slips for referrals.

- The mean number of indexes identified per facility-month remained stable after training, from 18.9 in the pre-training period to 21.2 in the post-training period. However, the mean number of partners listed per facility-month increased from 6.3 in the pre-training period to 10.6 in the post-training period. The mean number of contacts who received HIV testing (11.1 in the pre-training period and 24.8 in the post-training period) and the mean number of HIV-positive contacts identified per facility-month (1.3 in the pre-training period and 2.3 in the post-training period) also increased.
- The behavioural skills-building training for HCWs was successful in a range of meaningful outcomes, including identification of HIV-positive individuals in a passive index case programme. The researchers recommend more such approaches to increase access to HIV testing and thus linkage to HIV services.
- See also a study that found index case testing was feasible and had a high yield in 56 public-sector facilities in South Africa: [Davey, J.D., et al., 'HIV Positivity and Referral to Treatment Following Testing of Partners and Children of PLHIV Index Patients in Public Sector Facilities in South Africa', \*Journal of Acquired Immune Deficiency Syndromes\*, vol. 81 \(4\), 1 August 2019. doi: 10.1097/QAI.0000000000002048.](#)

[Tonon-Wolyec, S., et al., 'Acceptability, feasibility, and individual preferences of blood-based HIV self-testing in a population-based sample of adolescents in Kisangani, Democratic Republic of the Congo', \*PLoS One\*, vol. 14 \(7\), 1 July 2019. doi: 10.1371/journal.pone.0218795.](#)

- Adolescents living in sub-Saharan Africa constitute a vulnerable population at significant risk of HIV infection. This study aims to evaluate the acceptability, feasibility and accuracy of home-based, supervised HIV self-testing (HIVST) as well as their predictors among adolescents living in Kisangani, Democratic Republic of the Congo.
- A cross-sectional, door-to-door survey using a blood-based self-test kit and a peer-based, supervised HIVST was conducted from July to August 2018 in Kisangani. The acceptability and feasibility of HIVST were assessed among adolescents; the accuracy of HIVST was estimated by the sensibility and specificity of the adolescent-interpreted HIV self-test.
- A total of 628 adolescents aged 15–19 years were enrolled, including 369 girls. Acceptability of HIVST was high at 95.1 per cent of all individuals enrolled. The HIVST kit was used correctly by 96.1 per cent of participants, and 65.2 per cent asked for verbal instructions. Most adolescents (93.5 per cent) correctly interpreted their self-test results.
- The correct interpretation decreased significantly when adolescents had no formal education or attended primary school (37 per cent) as compared to those currently attending university (100 per cent; aOR: 0.01, 95% CI 0.004–0.03). The sensitivity of HIVST at home was estimated at 100 per cent and the specificity was 96.0 per cent. The majority of participants affirmed that post-test counselling was essential (68.0 per cent) and that face-to-face counselling was greatly preferred (78.9 per cent).
- The study found that home-based, supervised HIVST using a blood-based self-test and peer-based approach can be used with a high degree of acceptability and feasibility by adolescents living in Kisangani. Misinterpretation of test results is challenging to obtaining good feasibility of HIVST, as seen in this study among adolescents with poor educational level.

#### **Topic IV: Paediatric treatment of HIV**

[Nachman, S., et al., 'Long-acting or extended-release antiretroviral products for HIV treatment and prevention in infants, children, adolescents, and pregnant and breastfeeding women: knowledge gaps and research priorities', \*The Lancet HIV\*, vol. 6 \(8\), 1 August 2019. doi: 10.1016/S2352-3018\(19\)30147-X.](#)

- Antiretroviral agents with long-acting properties have potential to improve treatment outcomes substantially for people living with HIV. In November 2017, the Long-Acting/Extended Release Antiretroviral Resource Program (LEAP) convened a workshop with the aim of shaping the research agenda and promoting early development of long-acting or extended-release products for specific populations: pregnant and lactating women, children aged up to 10 years and adolescents aged 10–19 years.
- The goals included strategies and principles to ensure that the needs of children, adolescents and pregnant and lactating women are considered when developing long-acting formulations.
- The researchers point out that research should focus not only on how best to transition long-acting products to these populations but also on early engagement across sectors and among stakeholders. They urge for a parallel rather than sequential approach when establishing adult, adolescent and paediatric clinical trials and seeking regulatory approval. They also call for pregnant and lactating women to be included in adult clinical trials and improving trial designs to be adolescent-friendly to improve the recruitment and retention of young people.

[Bartlett, A.W., et al., 'Use and Outcomes of Antiretroviral Monotherapy and Treatment Interruption in Adolescents with Perinatal HIV Infection in Asia,' \*Journal of Adolescent Health\*, vol. 65 \(5\), November 2019. doi: 10.1016/j.jadohealth.2019.05.025.](#)

- Antiretroviral monotherapy and treatment interruption are potential strategies for perinatally infected adolescents living with HIV, who face challenges maintaining effective combination ART. This study assessed the use and outcomes for adolescents receiving monotherapy or undergoing treatment interruption in a regional Asian cohort.
- The study included data from adolescents who experienced at least two weeks of lamivudine or emtricitabine monotherapy or treatment interruption and trends in CD4 count and HIV viral load during and after episodes.
- Of 3,448 perinatally infected adolescents, 84 (2.4 per cent) experienced 94 monotherapy episodes and 147 (4.3 per cent) experienced 174 treatment interruptions. Monotherapy was associated with older age, HIV RNA greater than 400 copies/mL, younger age at ART initiation and exposure to at least two combination ART regimens. Treatment interruption was associated with CD4 count less than 350 cells/ $\mu$ L, HIV RNA greater than or equal to 1,000 copies/mL, ART adverse events and commencing ART at or after 10 years of age compared with under 3 years of age. Those who experienced monotherapy or treatment interruption for more than 6 months had worse immunologic and virologic outcomes.
- The researchers conclude that until challenges of treatment adherence, engagement in care and combination ART durability/tolerability are met, monotherapy and treatment interruption will lead to poor long-term outcomes.

[Carlucci, J.G., et al., 'Attrition of HIV-positive children from HIV services in low- and middle-income countries: a systematic review and meta-analysis', \*AIDS\*, Epub ahead of print, 2 September 2019. doi: 10.1097/QAD.0000000000002366.](#)

- This systematic review and meta-analysis of studies published through April 2016 examine the magnitude of attrition from HIV services within 60 months of follow-up

among children living with HIV in low- and middle-income countries. Attrition included loss to follow-up and death.

- From 3,040 unique studies, 91 met the researchers' eligibility criteria and were included in the analysis. They represented 147,129 children living with HIV, and the majority of studies (83 per cent) were from Africa.
- Most attrition occurred in the first six months of follow-up, increasing to 23 per cent by 36 months. Children with HIV receiving ART had significantly better retention in care than those not on ART. Studies that performed case-finding and tracing for those lost to follow-up had better retention in care up to 24 months of follow-up.
- The researchers highlight that their analysis shows a high rate of attrition of children from HIV services in low- and middle-income countries. Factors that may improve retention in care as seen in the studies in this analysis include decentralized patient support, including tracing, and early ART initiation.

## **Topic V: HIV service delivery for adolescents and young people**

[Maskew, M., et al., 'Adolescent HIV treatment in South Africa's national HIV programme: a retrospective cohort study,' \*The Lancet HIV\*, vol. 6 \(11\), 1 October 2019, doi: 10.1016/S2352-3018\(19\)30234-6.](#)

- Using routinely collected laboratory data from South Africa's National HIV Programme, the study aimed to quantify the numbers of adolescents accessing HIV care and treatment over time, characterize the role of perinatal infection in these trends and estimate proportions of adolescents seeking HIV services and ART in South Africa's public sector.
- The researchers reviewed data from 2005 to 2016 to estimate the total number of children and adolescents (aged 1–19 years) entering HIV care with a CD4 cell count or viral load test result as well as the proportion in care and receiving ART with at least one viral load test result. The analyses were stratified by gender and by whether the patient entered care at younger than 15 years (probably perinatally infected) or at 15–19 years (probably infected in adolescence).
- In this study period, 730,882 children and adolescents entered into care. Around half were adolescents (aged 15–19 years), and 301,242 (88 per cent) of the adolescents were girls. The number of virologically monitored patients aged 15–19 years receiving ART increased from 7,949 in 2005–2008 to 80,918 in 2013–2016. About 66 per cent (92,783) of adolescents seeking care started ART by 2016, well below the UNAIDS target of treatment for 90 per cent of those diagnosed. The researchers projected that the number of adolescents on ART will continue to rise.
- The researchers suggest that the increase in adolescents aged 15–19 years receiving ART reflect the ageing of children entering care at ages 1–14 years and increases in care-seeking among horizontally infected adolescents aged 15–19 years. However, there is still a large group of adolescents seeking care who do not receive ART, which suggests an urgent need for interventions to increase uptake of ART and improve services for this population.
- See also the commentary: [A. Pettifor, L. Filatreau and S. Delany-Moretlwe, 'Time to strengthen HIV treatment and prevention for youth'.](#)

[Haghighat, R., et al., 'Transition Pathways Out of Pediatric Care and Associated HIV Outcomes for Adolescents Living With HIV in South Africa', \*Journal of Acquired Immune Deficiency Syndromes\*, vol. 82 \(2\), 1 October 2019. doi: 10.1097/QAI.0000000000002125.](#)

- This study aimed to add to the understanding of transitions from paediatric to adult care among adolescents living with HIV in sub-Saharan Africa's public health sector. The researchers investigated pathways of transition and their associations with HIV outcomes in a longitudinal cohort of adolescents living with HIV in South Africa, using both clinic-based and community-tracing methods.
- Patient data were extracted through December 2017 for 951 adolescents (aged 10–19 years) initiated on ART in a health district of the Eastern Cape, South Africa. Pathways in HIV care were identified by tracing movements across facility care types and levels. Thematic analyses of semi-structured health care provider interviews identified transition support at facilities.
- Only 57.8 per cent of adolescents had initiated ART in paediatric care and 20.4 per cent of the total cohort had transitioned out of paediatric HIV care. Among the 42.2 per cent who had initiated ART in non-paediatric care, 93.8 per cent remained exclusively in non-paediatric care. The median age at first transition was 14 years. Two main pathways were identified: classical transition to adult HIV care (43.3 per cent) and down referral transition to primary health care clinics (56.7 per cent). In the classical transition pathway, adolescents transitioned out of paediatric care into specialized adult HIV care in a hospital or community health centres, remaining within secondary or tertiary care. In the down referral transition pathway, adolescents experienced transition out of paediatric care simultaneously with and because of a down referral to a primary health clinic where they received generalized adult HIV care.
- Across pathways, 27.3 per cent experienced cyclical transition or repeated movement between paediatric and non-paediatric care. Independent of covariates, adolescents with down referral transition were less likely to demonstrate viral failure (aOR 0.21, 95% CI 0.10–0.42). Mortality and loss to follow-up were not associated with either pathway. Median post-transition viral load change was not clinically significant or associated with transition pathways.
- This study proposes a contextually relevant model for transitions out of paediatric HIV care among adolescents in South Africa. From the analysis of health care provider interviews, the researchers add that feasible scalable "protocols" may mitigate risk of worsening post-transition HIV outcomes.

[Reif, L.K., et al., "FANMI": A Promising Differentiated Model of HIV Care for Adolescents in Haiti, \*Journal of Acquired Immune Deficiency Syndromes\*, vol. 82 \(1\), 1 September 2019. doi: 10.1097/QAI.0000000000002088.](https://doi.org/10.1097/QAI.0000000000002088)

- This study describes a model of differentiated service delivery for adolescents living with HIV called FANMI and the impact of a pilot implementation in Port au Prince, Haiti. Multiple studies have shown that only 60 per cent of adolescents living with HIV in Haiti remain in HIV care one year after the initiation of ART.
- FANMI was designed to address barriers including social isolation, family rejection, stigma and disjointed care with multiple providers. Adolescents enrolled in FANMI met monthly in cohorts of five to eight individuals to facilitate building relationships with peers, bolstering social support and reducing HIV-related stigma. These cohorts were stratified by age (10–15 years and 16–20 years) to address adolescents' unique developmental needs. The structure of each group meeting integrated peer counselling, social activities and medical care by the same providers each time.
- The researchers noted the structure of FANMI streamlined care and "de-medicalized" the HIV visit by expanding patient visits beyond clinical care. Group counselling topics included stigma, disclosure, family rejection and developing coping skills as well as ongoing educational counselling on HIV, risk reduction and adherence.

- This study included a retrospective chart review from adolescents who participated in the FANMI programme from November 2014 to October 2015. In this time, 50 adolescents participated in the programme with a median age of 17.5 years; 76 per cent were girls. All adolescents were assessed for ART eligibility and initiated ART the same day as HIV testing. At 12 months after ART initiation, 86 per cent of adolescents were retained in care. The proportion of adolescents who reported feeling hopeless in the past 30 days decreased from 38 per cent at enrolment to 20 per cent at 12 months, and the proportion who reported depression decreased from 34 per cent at enrolment to 17 per cent at 12 months. The proportion of adolescents reporting a desire for more emotional support from family and friends decreased from 94 per cent at enrolment to 50 per cent at 12 months. The proportion of participants reporting they used a condom every time they had sex increased from 8 per cent at enrolment to 26 per cent at 12 months.
- The researchers highlight the promising results from this pilot and note that the FANMI model of differentiated care for adolescents is now being evaluated in a large randomized control trial in Haiti with results forthcoming.

[Mesic, A., et al., 'Facilitators and Barriers to Adherence to Antiretroviral Therapy and Retention in Care Among Adolescents Living with HIV/AIDS in Zambia: A Mixed Methods Study', \*AIDS and Behavior\*, vol. 23 \(9\), September 2019. doi: 10.1007/s10461-019-02533-5.](#)

- This mixed-methods study aimed to understand factors that contribute to losses along the HIV continuum of care, especially ART adherence and retention in HIV care, among adolescents living with HIV in Zambia. The methods included six focus group discussions, four in-depth interviews and survey-based interviews with adolescents to identify, understand and describe factors contributing to losses along the continuum of care.
- Through focus group discussions and in-depth interviews, adolescents living with HIV identified barriers at the intrapersonal level (e.g., poverty, lack of adequate nutrition, fear of stigma), interpersonal level (e.g., stigma, disrespectful treatment by providers), institutional/facility level (e.g., lack of adolescent specific services) and community level (e.g., lack of collaboration among organizations, social norms).
- In quantitative interviews, the researchers found that 101 (46 per cent) of the 221 participating adolescents reported missing any clinic appointments in the past three months and about 41 (19 per cent) reporting missing one or more doses of ART in the last week. In the analysis, walking to the site of appointment and being currently employed were predictive of missed visits.

[Wilson, K.S., et al., 'Health provider training is associated with improved engagement in HIV care among adolescents and young adults in Kenya', \*AIDS\*, vol. 33 \(9\), 15 July 2019. doi: 10.1097/QAD.0000000000002217.](#)

- In this study, the researchers evaluated factors correlating to initial engagement in HIV care among adolescents and young people (aged 10–24 years) at facilities participating in a larger randomized trial in Kenya. Engagement in care was defined as return for first follow-up visit within 3 months among newly enrolled or recently re-engaged (returning after more than 3 months out of care) adolescents and young people.
- Among the 3,662 adolescents and young people meeting the eligibility criteria, 75.1 per cent were female, 54.5 per cent were older (aged 20–24 years) and 79.5 per cent were on ART. Overall, 2,639 of them returned for care (72.1 per cent) after the enrollment or re-engagement visit. Of note, engagement in care in this population was significantly higher at facilities offering provider training in adolescent-friendly care (85.5 per cent vs.

67.7 per cent) and at facilities that used the Kenyan government's adolescent care checklist (88.9 per cent vs. 69.2 per cent).

- The researchers suggest that adolescent-specific health provider training and tools may improve quality of care and subsequent engagement of adolescents and young people.

## Topic VI: HIV epidemic among adolescent girls and young women

[Birdthistle, I., et al., 'Recent levels and trends in HIV incidence rates among adolescent girls and young women in ten high-prevalence African countries: a systematic review and meta-analysis', \*The Lancet Global Health\*, vol. 7 \(11\), November 2019. doi: 10.1016/S2214-109X\(19\)30410-3.](#)

- The researchers aimed to summarize direct estimates of HIV incidence among adolescent girls and young women since ART was scaled-up in sub-Saharan Africa and before large investments in targeted prevention began in 2016.
- The systematic review and meta-analysis reported HIV incidence data from serological samples collected among adolescent girls and young women (aged 15–24 years) in 10 countries selected for DREAMS investment in 2015 (Eswatini, Kenya, Lesotho, Malawi, Mozambique, South Africa, United Republic of Tanzania, Uganda, Zambia and Zimbabwe). The main outcome was to summarize recent levels and trends in HIV incidence estimates collected between 2005 and 2015 by age and sex and pooled by region.
- There were 51 studies included from 9 of the 10 DREAMS countries. The directly observed HIV incidence rates were lowest among females aged 13–19 years in Kumi, Uganda (0.38 cases per 100 person-years). Directly observed HIV incidence rates were highest in KwaZulu-Natal, South Africa (7.79 per 100 person-years among females aged 15–19 years and 8.63 among those aged 20–24 years), in fishing communities in Uganda (12.40 per 100 person-years among females aged 15–19 years and 4.70 among those aged 20–24 years) and among female sex workers aged 18–24 years in South Africa (13.20 per 100 person-years) and Zimbabwe (10.80).
- In pooled rates from the general population studies, the greatest differences by sex were in the youngest age groups, such as among females aged 15–19 years compared with male peers. Incidence often peaked earlier among high-risk groups compared with general populations. Since 2005, HIV incidence among adolescent girls and young women declined in Rakai, Uganda, and Manicaland, Zimbabwe, as well as among female sex workers in Kenya, but HIV incidence did not decline in the highest-risk communities in South Africa and Uganda.
- The researchers note that there are few sources of direct estimates of HIV incidence in high-burden countries; trend analyses with disaggregated data for age and sex are rare but indicate recent declines among adolescent girls and young women. In some of the highest-risk settings, however, there is little evidence to suggest that ART availability and other efforts slowed transmission by 2016. Despite wide geographical diversity in absolute levels of incidence in adolescent girls and young women, risk relative to males persisted in all settings, with the greatest sex differentials in the youngest age groups.
- See also, commentary: [S Abdool Karim and C Baxter, 'HIV incidence rates in adolescent girls and young women in sub-Saharan Africa'.](#)

[Nguyen, N., et al., 'Sexual Partner Types and Incident HIV Infection Among Rural South African Adolescent Girls and Young Women Enrolled in HPTN 068: A Latent Class Analysis', \*Journal of Acquired Immune Deficiency Syndromes\*, vol. 82 \(1\), 1 September 2019. doi: 10.1097/QAI.0000000000002096.](#)

- Previous studies have demonstrated that sexual partners are a source of incident HIV infections among adolescent girls and young women in sub-Saharan Africa. This secondary analysis of data from girls and women aged 13–23 years enrolled in a randomized controlled trial of cash transfers for HIV prevention in South Africa examined sexual partner types and their relationship with risks of HIV transmission.
- The adolescent girls and young women in this cohort reported behavioural and demographic characteristics of their three most recent sexual partners, categorized each partner using prespecified labels, and received HIV testing. Latent class analysis was also used to identify partner types from these characteristics.
- There were 2,968 partners reported by 1,034 adolescent girls and young women, of whom 63 acquired HIV. The researchers identified five partner types by latent class analysis: monogamous HIV-negative peer partner; one-time protected in-school peer partner; out-of-school older partner; anonymous out-of-school peer partner; and cohabiting with children in-school peer partner.
- Compared to adolescent girls and young women with only monogamous HIV-negative peer partners, adolescent girls and young women with out-of-school older partners had 2.56 times the risk of acquiring HIV infections (95% CI 1.23–5.33) and adolescent girls and young women with anonymous out-of-school peer partners had 1.72 times the risk of acquiring HIV infections (95% CI 0.82–3.59).
- The authors note that analysis of partner types such as the method seen here can help guide the design of tailored HIV prevention interventions for adolescent girls and young women, providing an evidence base to help target those most at risk of HIV acquisition.

[Pettifor, A, et al., 'Cash plus: exploring the mechanisms through which a cash transfer plus financial education programme in Tanzania reduced HIV risk for adolescent girls and young women', \*Journal of the International AIDS Society\*, vol. 22 \(S4\), 22 July 2019. doi: 10.1002/jia2.25316.](#)

- In this qualitative study, the researchers explore experiences, perspectives and reported behaviours of adolescent girls and young women participating in a cash transfer-plus programme in rural United Republic of Tanzania. The programme from PEPFAR DREAMS and implemented with the Sauti Project and WORTH+ includes cash transfer and financial education for out-of-school adolescent girls and young women aged 15–23 years.
- The researchers conducted 60 in-depth interviews and 20 narrative timeline interviews with participating adolescent girls and young women between June 2017 and July 2018, primarily focused on partner choice and transactional sex.
- The study noted that participants in this cash transfer-plus programme discussed behaviours that could reduce HIV risk through decreasing their dependence on male sexpartners. There appeared to be two main mechanisms for this. Young women discussed the cash transfer providing for basic needs (e.g., food, toiletries), which appeared to reduce their dependence on male sex partners who previously provided these goods (e.g., through transactional sex). This experience was more pronounced among the poorest participants. Young women also discussed how the financial education/business development aspect of the programme empowered them to refuse some sex partners; unmarried women discussed these experiences more than married women. Social support from family and programme mentors appeared to strengthen young women's ability to start businesses, produce income and be less dependent on partners.
- The researchers note that the cash transfer programme may have reduced transactional sex that occurred to meet basic needs (one form of transactional sex) in this cohort. The

financial education, business development and mentorship elements of the programme appeared important in building agency, self-esteem and future orientation among adolescent girls and young women, which may have supported them in refusing unwanted sex partners. The researchers recommend that future cash-plus programmes consider adding or strengthening financial education, job skills training and mentorship.

[Celum, CL, et al., 'HIV pre-exposure prophylaxis for adolescent girls and young women in Africa: from efficacy trials to delivery', \*Journal of the International AIDS Society\*, vol. 22 \(S4\), 22 July 2019 doi: 10.1002/jia2.25298.](#)

- This commentary synthesizes evidence and expert opinion about PrEP efficacy and implementation for adolescent girls and young women in Africa, spanning from efficacy trials to emerging data from multiple demonstration projects.
- The researchers identified several early lessons from PrEP implementation projects: (1) awareness and demand creation with positive messaging about the benefits of PrEP are critical to motivate adolescent girls and young women to consider this novel prevention technology and to foster awareness among peers, partners, parents and guardians to support effective PrEP use among adolescent girls and young women; (2) PrEP initiation is high in projects that are integrating PrEP into youth-friendly clinics, family planning clinics and mobile clinics; (3) young African women who are initiating PrEP within demonstration projects are those at risk of acquiring HIV, with risk measured by behavioural characteristics, history of intimate partner violence, depression and prevalence of chlamydia and/or gonorrhoea; (4) provision of youth-friendly PrEP delivery programmes that integrate reproductive health services, including contraception and the diagnosis and treatment of sexually transmitted infections, increase health impact; (5) messages that emphasize the necessity for high adherence while at potential risk of HIV exposure and support strategies that address adherence challenges among adolescent girls and young women are essential; and (6) a substantial proportion of adolescent girls and young women do not persist with PrEP; strategies are needed to help assess their ongoing need, motivation and challenges with persisting with PrEP.
- The researchers conclude that PrEP is feasible to implement in integrated reproductive health service delivery models to reach adolescent girls and young women. They particularly note that these lessons learned are also relevant to the longer-acting and less adherence-dependent strategies that are currently in clinical trials.