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| **A) Manuscript Title** | **Zvandiri—Bringing a Differentiated Service Delivery Programme to Scale for Children, Adolescents and Young People in Zimbabwe** |
| **b) Author Information***(full names, academic degrees, affiliations)*  | 1. **Nicola Willis**; BN (Hons), MPhil;Africaid, Harare, Zimbabwe  |
| 2. **Tanyaradzwa Napei**; BSc, BSS, MSc; Africaid, Harare, Zimbabwe |
| 3. **Alice Armstrong**; BScN, MSc; Consultant, Zvandiri, London,UK  |
| 4. **Helen Jackson**; BA Hons, Dip Hum Biol, MSc; Consultant, Zvandiri, Mauritius  |
| 5. **Tsitsi Apollo**; MBChB, MPH, MBA; Ministry of Health and Child Care, Harare, Zimbabwe  |
| 6. **Angela Mushavi**; MBChB MMed (Pediatrics); Ministry of Health and Child Care, Harare, Zimbabwe  |
| 7. **Getrude Ncube**; MIH; Ministry of Health and Child Care, Harare, Zimbabwe  |
| 8. **Frances M Cowan** MBBS, MRCP, MSc, MD, FRCP, FRCPE; Centre for Sexual Health and HIV/AIDS Research (CeSSHAR), Harare, Zimbabwe and Liverpool School of Tropical Medicine |
| **C) Contact Information** *(correspondence name & address, fax & telephone #s, e-mail address)* | Nicola WillisZvandiri House, 12 Stone Ridge Way North, Avondale, Harare, Zimbabwe; +263 4 335805; nicola@zvandiri.org |
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**Abstract**

**Background**

Since 2004, there has been a dramatic shift in the HIV response for children, adolescents and young people in low resource settings. Previously programmes and services were largely orientated to adults. This is now changing but there is limited evidence on how to take services for children, adolescents and young people living with HIV (CAYPLHIV) to scale.

**Setting**

Zvandiri is a theoretically grounded, multi-component differentiated service delivery model for children, adolescents and young people in Zimbabwe that integrates peer-led, community interventions within government health services.

**Methods**

Africaid analysed routine programme and other data from November 2004 to October 2017 to document Zvandiri scale up, framed by the WHO framework for scaling up interventions.

**Results**

Since 2004, Zvandiri has evolved from one support group in Harare into a comprehensive model, combining community- and clinic-based health services and psychosocial support for CAYPLHIV. Zvandiri was scaled up across Zimbabwe through phased expansion into 51 of 63 districts, reaching 40,213 CAYPLHIV. Evidence indicates that this approach improved uptake of HIV testing services, adherence and retention in care. The environment and strategic choices were critical when taking the model to scale, particularly nesting the programme within existing services, and capacity strengthening of service providers working jointly with trained, mentored CAYPHIV.

**Conclusion**

The results provide a firm foundation for programming and from which to build evidence of sustainable impact. Formal impact evaluation is needed and underway. These programme data contribute to the essential evidence base on strategic approaches to assist in planning services for this relatively neglected group.

**Key words: HIV, Paediatric, Adolescent, Scale up**

**Introduction**

Since 2004, there has been a dramatic shift in the HIV response for children, adolescents and young people in low resource settings. With the roll out of antiretroviral therapy (ART), children born with HIV have survived beyond infancy and into adolescence. Together with the growing number of new infections among young people, children, adolescents and young people now significantly shape the HIV epidemic. Yet programmes and services have been largely orientated to adults, with limited commitment to the specific needs of children, adolescents and young people living with HIV (CAYPLHIV).

Despite gains made in numbers on treatment, CAYPLHIV experience late diagnosis and disclosure, higher rates of loss to follow up, poor adherence and less viral suppression than adults.[[1]](#endnote-1), [[2]](#endnote-2), [[3]](#endnote-3) A systematic review in resource-limited settings found that, in children 0-10 years initiated on ART, 5-29% were either lost-to-follow-up or dead within 12 months.[[4]](#endnote-4) From 2005 to 2012, AIDS-related deaths in adolescents 10-19 years rose 50% while AIDS-related deaths among adults fell by 30%.[[5]](#endnote-5) In addition to opportunistic infections, those born with HIV commonly face growth and developmental delay and other chronic conditions,[[6]](#endnote-6),[[7]](#endnote-7) complex psychosocial stressors and poor mental health.[[8]](#endnote-8),[[9]](#endnote-9),[[10]](#endnote-10) These challenges, and their influence on HIV outcomes highlight the need for comprehensive, age and developmentally appropriate HIV services.

Increased global awareness has led to a surge of global- and national-level guidance to strengthen service delivery for CAYPLHIV.[[11]](#endnote-11),[[12]](#endnote-12) These inputs have been accompanied by funding initiatives such as Accelerating Children’s HIV/AIDS Treatment (ACT), which aimed to close the HIV treatment gap for children and adolescents in nine countries. Global guidance on differentiated service delivery (DSD) recognises the need to adapt services for children and adolescents.[[13]](#endnote-13) Despite the emerging guidance, insufficient evidence exists on how to take these services to scale.[[14]](#endnote-14)

From 2004, Zimbabwe has scaled up paediatric and adolescent HIV services, culminating in approximately 80% of the estimated 72,887 children and 63,176 adolescents with HIV being on ART by December 2017.[[15]](#endnote-15) This scale up included the adoption of the Zvandiri programme of Africaid, a local, non-government organisation (NGO) in Zimbabwe. Zvandiri is a theoretically grounded, multi-component DSD model for CAYPLHIV that integrates peer-led, community interventions within national service delivery. Here we describe the Zvandiri scale-up process and results from November 2004 to October 2017.

**Methods**

Africaid analysed routine programme data to document the process of Zvandiri scale up, its outputs and outcomes. The World Health Organization (WHO) framework for scaling up interventions was used systematically to guide the analysis[[16]](#endnote-16) (Figure 1).

**Figure 1: The ExpandNet / WHO Framework for Scaling Up**

We documented Zvandiri programmatic data to show the timing and scale up of the various components of the Zvandiri model, as well as numbers reached of primary beneficiaries (CAYPLHIV aged 0-24 years) and secondary beneficiaries (service providers, families). Data were analysed to provide evidence of the role of Zvandiri on HIV Testing Service (HTS) uptake, adherence, retention, viral suppression and psychosocial well-being, as well as its influence on the engagement of CAYPLHIV across the HIV cascade, children’s agency, health care systems, family support and stigma reduction. Data came from Africaid’s internal and external reports and the Zvandiri database, an electronic medical record of each CAYPLHIV registered. All data were anonymised to protect individual confidentiality, facilitating research approval by the Medical Research Council of Zimbabwe without ethical review.

We also reviewed all Zvandiri in-house and published materials, including: independent documentation by external partners, funders and evaluators; conference abstracts, and published papers. National and international documents on paediatric and adolescent HIV were also reviewed regarding the wider context for Zvandiri scale up.

**Results**

**Elements of Scaling Up**

1. ***Innovation - The******Zvandiri Programme***

The goal of Zvandiri, meaning “As I am”, is that CAYPLHIV, 0-24, have physical, social and mental well-being. Zvandiri aims directly to improve young people’s experience across the HIV cascade—HIV diagnosis, disclosure, linkages, adherence, retention —and to provide ongoing support for their mental health, social protection and sexual and reproductive health. Since 2004, Zvandiri has evolved from one support group in Harare into a comprehensive model, combining community- and clinic-based health services and psychosocial support for CAYPLHIV. At the forefront of service delivery are adolescents and young people living with HIV, 18-24 years old, who are trained and mentored by MoHCC and Africaid as peer counsellors known as community adolescent treatment supporters, or ‘CATS’. Their role is to support CAYPLHIV across the HIV cascade through a variety of complementary services integrated within government and private sector clinical care packages, and social protection services.

CATS are attached to health facilities within their own communities and supervised by MoHCC staff, with technical support from district-based Zvandiri mentors employed by Africaid. CATS identify and refer undiagnosed children, adolescents and young people through index case finding and support pre- and post-test HIV counselling and disclosure. They support the linkage of HIV negative clients to HIV prevention services while those confirmed as HIV positive are registered with Zvandiri. CATS manage a caseload of up to 60 CAYPLHIV whom they support through home visits, support groups, clinic visits and MHealth (Figure 2).

**Figure 2: The Zvandiri Programme**

Zvandiri has been scaled up across Zimbabwe through phased expansion, with replication of the model from Harare in 2004, to six districts in 2010, and to three provinces in 2011. In 2014, the MoHCC adopted Zvandiri as a key component of its national accelerated action plan for paediatric and adolescent HIV treatment, while the Department of Social Welfare rolled out Zvandiri within its national case management system to strengthen the identification and response to child protection violations against CALHIV. At the end of 2017, Zvandiri was established in 51 of 63 districts (81%) across all 10 provinces of Zimbabwe.

The support provided by Zvandiri is differentiated according to the clinical and psychosocial circumstances of individual clients (Table 1).

**Table 1: Zvandiri Levels of Support**

Zvandiri’s first support group in 2004 served eight adolescents; by the end of 2017, 40,213 CAYPLHIV were actively engaged in Zvandiri services (5,312 aged 0-4 years; 5,830 aged 5-9; 7,976 aged 10 – 14; 11,245 aged 15 – 19; 9,850 aged 20-24). In partnership with health and child protection services, 1,167 CATS are integrated within 613 of 1,490 clinics (41%), co-facilitate 421 support groups and provide monthly information, counselling, monitoring and support for their respective caseloads.

**Figure 3: Scale-up of the Zvandiri Programme Components and Resulting Outputs from 2004-2017**

Cascade data from 161 sites in 2017 revealed that of 5,868 children, adolescents and young people mobilised by CATS through index case finding, 976 (17%) were diagnosed with HIV; 947 of 976 (94%) were initiated on ART; 909 (96%) were retained at six months and 928 (98%) at 12 months.. Programmatic data from 148 PEPFAR-supported Zvandiri sites over 15 months suggests improved linkages in these sites with 73% (6893/9487) newly diagnosed adolescent girls and young women initiated on ART compared with 69% (2520/3638) in non-Zvandiri sites.[[17]](#endnote-17) The impact of Zvandiri on virologic suppression is currently being investigated in two randomised control trials[[18]](#endnote-18),[[19]](#endnote-19) . Institutional and family-level outcomes are presented in Table 2.

**Table 2: Evidence of Outcomes of the Zvandiri Programme**

Operations research in a rural district of Zimbabwe found improved self-reported adherence from 44.2% at baseline to 71.8% at 12 months (p-value=0.008) among adolescents receiving Zvandiri services. They were 3.9 more times likely to adhere to treatment (self-report) compared with the control group receiving standard care (OR 3.934).[[20]](#endnote-20) ~~Retention and psychosocial well-being also improved among those receiving Zvandiri services.~~ Confidence, self-esteem and self-worth was improved (increased by 0.49 points (p-value=0.001) compared with 0.15 points p-value=0.078). Adolescents in the intervention arm reported improved quality of life (p-value=0.028) compared with a decline in quality of life in the control arm (p-value=0.011). Health care workers reported improved retention in care among adolescents receiving Zvandiri. One Sister in Charge stated, “*Adolescents no longer miss their clinic reviews because the CATS remind them. There is also reduced loss to follow up since each CATS has a group of children and adolescents to follow up and care for*”. Additional studies by Zvandiri, the MoHCC and research institutions have explored the experiences and service delivery needs of different sub-populations of CAYPLHIV, including those with virological failure,[[21]](#endnote-21) disability,[[22]](#endnote-22) mental health conditions[[23]](#endnote-23) and those who are pregnant or breastfeeding.[[24]](#endnote-24) The findings from these studies led to further differentiation of the Zvandiri model as shown.

1. ***User organisations***

The multifaceted Zvandiri approach to CAYPLHIV complemented MoHCC goals to improve HIV treatment outcomes among this population. Since 2008, Africaid has supported the MoHCC and National AIDS Council (NAC) in training 2,364 health care workers in HIV testing, treatment and care that is responsive to the needs of CAYPLHIV and integrates Zvandiri. This training later expanded to include social workers, teachers and rehabilitation officers, forming a multi-sectoral response to promoting better HIV outcomes as well as social and mental well-being for CAYPLHIV. Working jointly, the MoHCC, Ministry of Public Services, Labour and Social Welfare (MoPSLW), and the Ministry of Primary and Secondary Education (MoPSE) have progressively integrated Zvandiri interventions within national systems across Zimbabwe, achieving multi-sectoral scale up. The Zvandiri roll out was planned at national level—in partnership with provincial and district level teams and CATS—and then implementation was cascaded to the clinic and community level. At the end of 2017, Zvandiri mentors were integrated by MoHCC within its national clinical mentorship programme.

1. ***Environment***

Zvandiri scale up has both coincided with and contributed directly to changes in the policy environment (globally and within Zimbabwe) resulting in more comprehensive service delivery supported by a more favourable funding environment for paediatric and adolescent HIV. Since adopting the 2016 WHO recommendations for innovative ART delivery models,[[25]](#endnote-25) Zimbabwe has dramatically scaled up ART provisions nationwide, including for children and adolescents of whom around 80% are now enrolled in treatment.15 This required the development of national guidelines for paediatric and adolescent HTS, treatment and care and the training and mentorship of health care workers.[[26]](#endnote-26) The MoHCC, Zvandiri and young people living with HIV (CATS) also jointly developed the CATS training curricula, service delivery guidelines, job aides, counselling tools and mentorship guidelines, thus promoting standardised, integrated training and service delivery nationwide.

Zvandiri developed through the active engagement, training and leadership of the CATS, so that youth-identified needs, values and perceptions were always at the forefront in planning and implementation. The MoHCC recognition of CATS’ core roles in the clinic-community care continuum and at policy and strategic levels was critical in generating an enabling environment at all levels.

1. ***Resource team***

The MoHCC and MoPSLSW led and coordinated Zvandiri service scale up at all levels, with technical assistance (TA) from Africaid and directly informed by CAYPLHIV and their families. CAYPLHIV continually assist programme implementation by sharing their needs and experiences, and serving as trained, mentored CATS, as well as expert trainers, researchers, and advocates. The role of Africaid staff has evolved from direct implementation to providing technical assistance to government health, social protection and education cadres.Research partners are also a critical part of the resource team, producing quantitative and qualitative data that have informed Zvandiri development and outcome monitoring. An impact evaluation to determine effectiveness and cost effectiveness is currently underway.18 Likewise, donor technical support for documentation, monitoring and evaluation has added value throughout.

1. ***Scaling up strategy***

***Dissemination and advocacy***

A combination of methods was utilised to promote and communicate the importance of scale up of DSD for children and adolescents. Vertical approaches included the participation of Africaid staff and young Zvandiri advocates in influencing not just national but global policy and strategies, including the development of the WHO ART guidelines, with adolescent-specific guidelines.25 Young people have been at the forefront of local, national and international advocacy through creative and moving adolescent-led awareness and advocacy activities using a range of media, targeting policy makers, governments, service providers, communities, religious leaders and families. The model has also been disseminated through external documentation recommending Zvandiri as a model of best practice for scale up nationally and regionally. [[27]](#endnote-27) [[28]](#endnote-28) [[29]](#endnote-29)

***Organisational Processes***

Zvandiri evolved from an NGO-led model with strong community-clinic linkages into a government-led, decentralised approach with technical and implementational support from the NGO. Zvandiri services were initially facilitated by Africaid staff. Now, planning and implementation of Zvandiri services has been adopted by the MoHCC nationally, with provincial and district cadres coordinating services through their respective clinics, assisted technically by Zvandiri district mentors. These include 24 graduated CATS now employed by Africaid. The model has been cascaded through national plans and existing structures and layered on to the national HIV programme and health delivery system, and integrated into the national case management system. A strategic choice was made to scale the model through MoHCC alone, rather than through other implementing partners, and to ensure strong linkages with those partners for layering of CAYPLHIV services.

Zvandiri scale up required that Africaid expand its organisational capacity as leading technical partner to the Government of Zimbabwe and to manage multiple, large grants. Funding partners who invested in Africaid’s organisational capacity, not merely supporting programmes, have been key.

***Costs and Resource Mobilization***

In 2004, few resources for CAYPLHIV were available, mainly individual donations and small, short-term grants. With increasing evidence of children living with HIV surviving into adulthood and of their poor outcomes,[[30]](#endnote-30), [[31]](#endnote-31) resource mobilisation improved, and was essential for Zvandiri scale up. Young Zvandiri advocates actively assisted the Global Fund replenishment process and mobilisation of domestic resources. The model was costed27 which informed scale up funding from PEPFAR. Other donors also became involved, funding various components in different geographic areas. Key costs included CATS training, monthly stipends, bicycles and mobile phones, district level CATS coordination meetings and supervision by Zvandiri mentors.

***Monitoring and Evaluation***

Zvandiri scale up necessitated the evolution of Africaid’s monitoring and evaluation systems from simple, paper-based tools for monitoring support group attendance to a complex, electronic medical record system capable of tracking services received by 40,213 individual registered CAYPLHIV. The Zvandiri Mobile Database App (ZVAMODA) was developed for CATS and Africaid staff to capture real time data in each district. The scale up involved a shift from traditional process and output indicators, to tracking outcome indicators including HTS uptake and yield, treatment initiation and retention, viral suppression and psychosocial well-being. In partnership with government ministries and funding partners, national, donor-specific and Africaid-customised indicators are used to track quantitative and qualitative data, and to describe process, outcome and, to a limited extent, programme impact of the programme to inform continued programming and scale up. Africaid adopted key MoHCC M&E tools for use by Africaid staff and CATS, and ensured M&E training and site supervision visits to monitor quality and fidelity to the Zvandiri model in partnership with MoHCC.

**Key Lessons Learned**

Key lessons learned included the following:

* Government leadership and coordination were critical in driving scale up of an integrated, sustainable, differentiated service for CAYPLHIV
* Packaging Zvandiri as a defined model of care, including joint development of guidance, training curricula and implementation tools, promoted standardised uptake and implementation of services in line with national plans and systems
* Integration of training, supervision and mentorship within national systems with technical assistance from an NGO at national, provincial and district level, has been essential for government ownership and support for CATS
* Beneficiary involvement in all aspects of programme design and delivery, monitoring, evaluation and research has been critical, acceptable and sustainable
* Development of paediatric and adolescent indicators to reflect DSD, as well as the clinical and psychosocial outcomes for this population has promoted awareness of the need and impact for differentiated services
* Use of programmatic data, together with partnerships with research institutions, has produced robust evidence for informing policy, service delivery and scale up, as well as resource mobilisation
* Strengthened and scaled up objective markers, including routine viral load testing and refined measures of mental health, are needed to demonstrate sustained impact
* Basic cost-effectiveness and cost-benefit data can strengthen evidence for good practice and sustainable impact.

**Limitations**

There are three main limitations to this review of Zvandiri programme scale up, all of which are currently being addressed. First is the need to strengthen impact monitoring to include use of additional objective measures, notably routine viral load testing and improved, standardised mental health measures. Second, the analysis does not cover basic cost-effectiveness and cost-benefit data needed to confirm the efficiency of various programme components and identify opportunities to improve efficiency. Third, the analysis does not include direct quality assurance measures required to safeguard against the risk of decline in quality and intensity of service provision, a core concern in programme scale up.

**Discussion**

Rigorous evidence on how to bring DSD models to scale for CALHIV is required. Here, we described the process of taking one model to scale, its outcomes and lessons learned, and presented enabling factors that contributed to its success. Zvandiri is arguably the largest, national DSD model for CAYPLHIV in sub-Saharan Africa. Programmatic and research evidence indicate that this approach has improved uptake of HIV testing services, adherence and retention in care, outcomes likely to link with improved survival, health and psychosocial well-being among CAYPLHIV in Zimbabwe. Further impact evaluation is needed and is underway.

A review of innovative strategies in 12 countries noted how rarely routine monitoring was used to inform scaling up.[[32]](#endnote-32) In Zvandiri, monitoring and evaluation has gradually been strengthened to demonstrate results, and must be developed further to assure quality and intensity of service provision, and to measure sustained impacts. The WHO framework for scale up proved to be a useful tool for analysing the scale-up process, particularly in relation to the environment and strategic choices involved. Key enablers for scale up included all elements within the overarching WHO framework.16

Zvandiri scale up was limited for many years by a lack of international recognition of the escalating numbers and the needs of CAYPLHIV. Gradually, attention focused on the CAYPLHIV care gap, creating an opportunity to expand services for this neglected cohort. Funding increased, and global and national policies and guidelines were developed to which Zvandiri was able actively to contribute, including substantive input from primary beneficiaries themselves. With its years of experience and evidence of improved uptake of HIV diagnosis and care among CAYPLHIV, active involvement of trained CATS and a multifaceted approach, Zvandiri tapped into the increased awareness and support, and rapidly expanded the programme both vertically and horizontally. Diverse stakeholders were brought on board early and played key and complementary roles, ensuring that the resource base was comprehensive and sufficiently robust to support this growth. Implementation materials and guiding documents were jointly developed by Zvandiri and MoHCC, contributing to national commitment and ownership. The importance of engaging and training end users, the CATS, in the scale up has been highlighted, and also the extent of community involvement.

 Other crucial enablers included strong leadership, a clearly defined model that could be integrated within existing structures, and the long-term vision of sustainability through strengthening national, provincial, district and local capacity to take effective programme ownership and leadership. Africaid’s role has evolved from direct implementation into primarily one of technical support and continued dissemination and advocacy both within and beyond Zimbabwe. The process for expansion was iterative, incorporating programmatic and research evidence to facilitate flexibility as the environment changed and new needs arose.

The number of children and adolescents on ART will continue to increase owing to the successful response to the ambitious targets for HTS and ART initiation. Evidence to date suggests that this response should be supported by investments in services that respond to the social, developmental and mental health needs of this population, in order to promote virological suppression, retention in care and mental health. Yet there remains limited literature on the effectiveness of interventions for this age group and limited understanding of how to take these interventions to scale. This dearth was confirmed in the recent WHO and IAS global research agenda for adolescents living with HIV.[[33]](#endnote-33) The Zvandiri model bridges this knowledge gap and supports particularly vulnerable CAYPLHIV thus generating increased equity in its services.

We suggest that Zimbabwe’s experience of scale up provides important lessons to inform policy and programming for CAYPLHIV. Africaid, with support from MoHCC and its funding partners, has now established the Zvandiri Technical Support Team to guide countries wishing to adopt Zvandiri services. This team has already supported Mozambique, Tanzania and Swaziland, where there are now 170 CATS.[[34]](#endnote-34) The same principles of government leadership, technical partnerships with local NGOs, meaningful engagement of young people and the adoption of a clearly defined, packaged model have also been critical in these countries.

**Conclusion**

The Zvandiri model brings to scale holistic support of CAYPLHIV that is responsive to their medical, developmental and psychosocial needs. Model development required various complementary factors that created a window of opportunity for scale up and continued support. In particular, to assure sustainability, the programme was nested within existing services with capacity strengthening of national, regional and local service providers and trained, mentored CATS supporting their peers, families and communities. Emphasis now needs to be on ensuring programme sustainability at scale with quality and intensity of service provision to achieve impact.

We have combined programmatic and evaluation data to demonstrate the substantial gains that the programme has achieved, and provided information on programmatic and evaluation gaps. The results highlight the importance of the environment and strategic choices when taking a model to scale. The results also provide a firm foundation to support programming as well from which to build in terms of gathering longer-term, sustainable impact. Although impact analysis is not yet available, the current and future data should contribute to the essential evidence base on strategic approaches to assist this relatively neglected cohort even in high HIV prevalence, low resource settings.

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**Figure Captions**

Figure 1: The ExpandNet / WHO Framework for Scaling Up

Figure 2: The Zvandiri Programme

Figure 3: Scale-up of the Zvandiri programme components and resulting outputs between 2004-2017

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