



## RESOURCE REQUIREMENTS

FOR MEETING AND SUSTAINING THE ACCELERATING CHILDREN'S TREATMENT (ACT) TARGETS FOR PEDIATRIC ANTIRETROVIRAL TREATMENT (ART) IN TANZANIA

*Brief*

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### Introduction

The Accelerating Children's HIV and AIDS Treatment Initiative (ACT) is a US\$200 million, two-year effort to double the number of children and adolescents 0–19 years of age<sup>1</sup> receiving life-saving antiretroviral treatment (ART) in nine priority countries in sub-Saharan Africa. Under ACT,<sup>2</sup> Tanzania is receiving US\$30 million in FY 2015 and 2016 from PEPFAR and the Children's Investment Fund Foundation (CIFF) to support procurement of pediatric ART commodities, service delivery, and health systems strengthening, including creating national-level databases, guidelines, and tools for pediatric ART (PEPFAR, 2015). To inform ACT implementation, resource mobilization, and sustainability planning, the USAID- and PEPFAR-funded Health Policy Project (HPP) identified key pediatric care and treatment challenges through a desk-based review and qualitative analysis, estimated some of the currently quantifiable costs of meeting pediatric treatment targets in Tanzania, and compared these resource requirements with ACT funding.

Tanzania is a priority ACT country, as it has a large burden of HIV-positive children not yet initiated on ART and great disparities in ART coverage between adults and children (PEPFAR and MOHSW, 2014). By December 2014, an estimated 142,721 children 0–14 years of age were living with HIV in Tanzania, of which just 41,882 (29%) were receiving ART (Government of Tanzania, Unpublished; MOHSW, Unpublished[b]). In response, the National AIDS Control Program (NACP) aims to expand access to pediatric ART by strengthening the pediatric treatment cascade. The treatment cascade (also called continuum of care) is a model that delineates the sequential steps or stages of clinical care that children with HIV go through, from initial diagnosis and engagement in care/treatment initiation to achieving the goal of viral suppression (MOHSW, 2014). Further, in May 2015 Tanzania adopted a new policy recommending that all people living with HIV ages 0–14 years initiate treatment regardless of CD4 cell count or clinical stage (MOHSW, 2015). Since January 2016, in line with the World Health

Organization’s (WHO) 2013 guidelines, children 0–14 years of age receiving ART are to be monitored through routine viral load testing where this service is available.

Scaling up and sustaining gains in pediatric ART under ACT requires an understanding of the financial resources needed and available for pediatric ART and related services. The resource need estimates should reflect the cost of resolving programmatic challenges across the cascade in delivering HIV care and treatment to children living with HIV, especially as Tanzania strives to reach higher levels of coverage. Consolidated information on pediatric ART costs, funding, and implementation challenges along the pediatric cascade is unavailable in Tanzania.

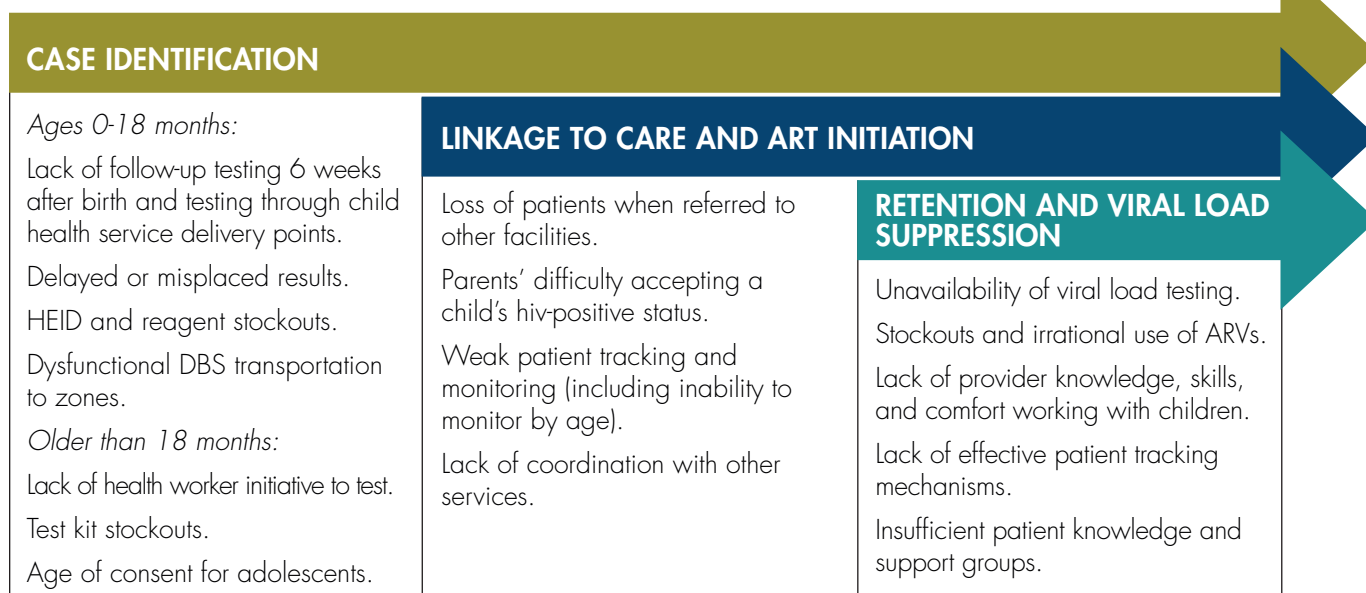
**Qualitative methodology:** To understand programmatic challenges, promising practices, and potential solutions related to pediatric HIV in Tanzania, HPP conducted interviews with the NACP and two PEPFAR implementing partners that receive the majority of Tanzania’s ACT funding. Interviews addressed issues across the pediatric treatment cascade (see Figure 1). Interviewees identified overarching challenges, including the short implementation timeline under ACT (two years), insufficient financial resources for pediatric care and treatment, limited health worker capacity, supply chain weaknesses, lack of community and other linkages, and poor monitoring and data use. Many of the challenges reported in Tanzania are also seen in Kenya, where a more detailed qualitative analysis was undertaken with 18 implementing partners (Dutta et al., 2015).

## Key Challenges Across the Pediatric Treatment Cascade, Areas for Further Study

**Identification:** Children account for about 10 percent of all people living with HIV in Tanzania, but represent less than 6 percent of HIV diagnostic tests performed (PEPFAR and MOHSW, 2014). Respondents cited specific identification challenges based on children’s age:

- **HIV-exposed infants ages 0–18 months:** Lack of attempts to identify HIV-exposed infants through pediatric health facility priority service delivery points (e.g., immunization), stockouts of HIV early infant diagnosis (HEID) commodities, delayed (by more than one month) or misplaced DNA PCR results, and dysfunctional transportation of dried blood spot (DBS) for testing from the districts to zones.
- **Children over the age of 18 months:** Unavailability of rapid test kits (RTKs) (Global Fund, 2016); lack of initiative among facility-in-charges and health workers to offer provider-initiated testing and counseling to children; lack of training, mentorship, and supportive supervision to guide lay counselor-driven HIV testing among children inhibiting community-based HIV testing (PEPFAR and MOHSW, 2014).

**Figure 1.** Challenges Along the Pediatric Treatment Cascade in Tanzania



- **Adolescents:** Consent issues that hinder opt-out testing—for those under 18 years of age, a parent/guardian’s consent is required for HIV testing, and there are no clear procedures for health providers to petition for HIV testing in the absence of parental consent.

Investments in active case finding strategies are needed to address these challenges. With increased coverage of prevention of mother-to-child transmission (PMTCT), more efficacious PMTCT regimens, and behavioral prevention for adolescents, fewer new HIV infections are expected in the future among children ages 0–14 years. PEPFAR is currently directing efforts toward districts with high pediatric HIV prevalence and health facilities with high-yield potential for pediatric HIV case identification and linkage-to-care. Reaching high levels of pediatric ART coverage in the future, however, will require expanding effective identification strategies into areas with lower overall HIV prevalence and harder-to-reach populations. The costs of such an expansion, while not yet known, are likely to be greater than those incurred in focused efforts targeting high-burden districts and facilities.

**Linkage-to-care and treatment initiation:** Among a cohort of pediatric ART patients in three regions, the proportion of children entering treatment through PMTCT nearly doubled in recent years, rising from 7 percent in 2005–2007 to 15 percent in 2010–2011. Although this indicates that linkage-to-care for children has improved (Nuwagaba-Biribonwohal et al., 2013), linkage-to-care and treatment initiation remain challenges country wide (PEPFAR and MOHSW, 2014). Of the 22,195 children under 15 identified as HIV positive in PEPFAR-supported sites in FY 2015, nearly 9,000 did not initiate ART (PEPFAR, 2016). Further, Tanzania has not fully implemented the new guidelines recommending all children initiate ART, as there are still children on care who have not started ART. Respondents indicated that various factors contribute to poor enrollment of children in treatment:

- Failure to provide patients with unique identifiers prevents national measurement or baseline estimates of linkage-to-care for any age group and may result in double-counting of patients.
- Lack of escorts available to accompany patients who need to be referred to a facility with a care and treatment center (CTC) to that facility.
- Parents of children diagnosed with HIV receive limited support, and linkages between communities and facilities are weak.

- Lack of coordination at the district level prevents ART from being linked with other social support services for children and adolescents. For example, there is a need to improve linkages between pediatric ART services and services for orphans and vulnerable children.

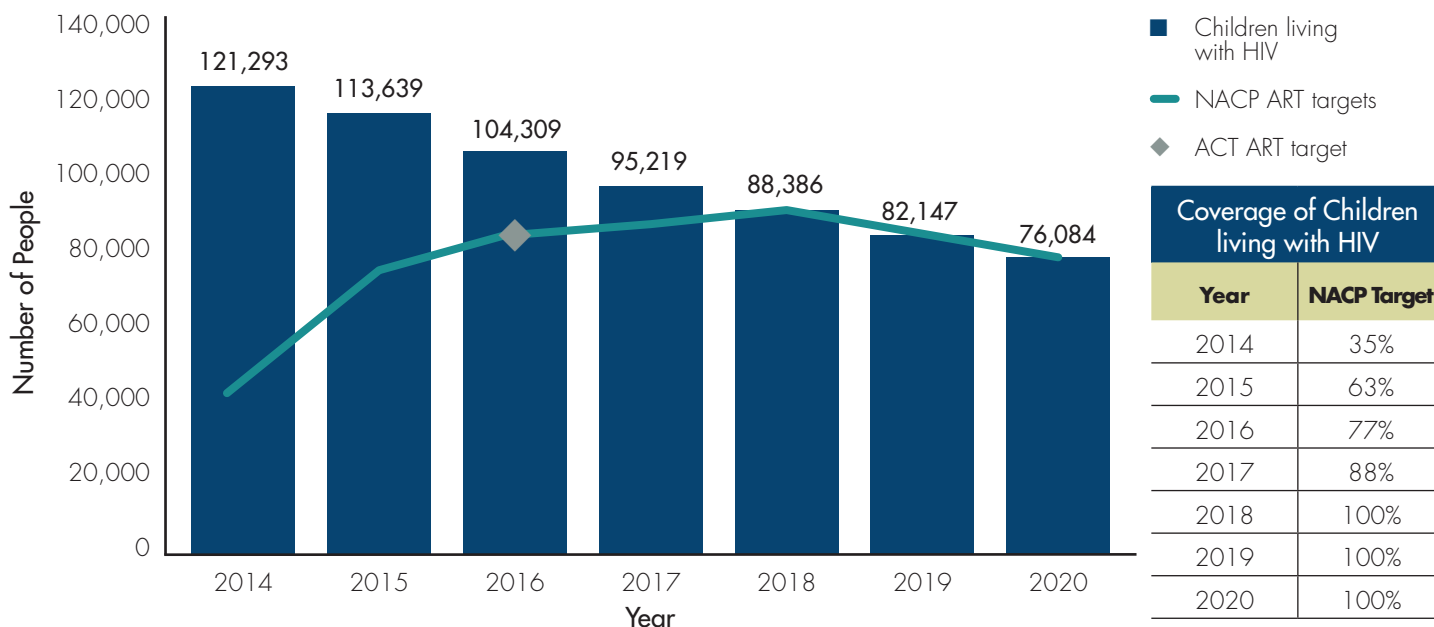
**ART retention and viral suppression:** About one-in-five children on ART abandon treatment following initiation (Global Fund, 2016). Primary challenges related to retention, adherence, and viral load suppression identified by respondents include

- The limited availability of viral load monitoring;
- Stockouts and irrational use of antiretroviral drugs (ARVs)—While sufficient quantities of pediatric ART commodities are usually procured in a timely manner at the national level, Tanzania still faces stockouts due to poor planning or facilities’ failure to place orders in a timely fashion (Global Fund, 2016), and facilities are unable to offer multiple-month ARV refills;
- Lack of patient tracking systems;
- Insufficient patient knowledge and support—Respondents indicated that stigma and lack of support put adolescents at particularly high risk of poor adherence and retention; and
- Lack of knowledge, skills, and comfort in working with children among health providers—For instance, respondents reported that health workers sometimes fail to provide appropriate ARV doses for children because they lack the understanding and skill needed to adjust dosage based on a child’s weight.

A study looking at ART retention among pediatric ART patients in Dar es Salaam found that children under the age of two and children of undernourished patients are at higher risk of being lost to follow-up (McCormick et al., 2015). Adherence and retention may improve if healthcare workers and support staff are aware of these risk factors and can work with parents and children to understand the importance of taking their medicine. Patients also need to receive support through teen clubs and monthly meetings for children on ART, as identified in the country’s ACT strategy.

Respondents indicated that overcoming barriers to retention, adherence, and viral load suppression requires greater mentorship, supervision, and training of health workers and laboratory staff on pediatric ART. Addressing these barriers also requires improved patient tracking and use of data for commodity forecasting,

**Figure 2.** Number of People Ages 0–14 Years Living with HIV and Pediatric ART Targets



Note: NACP targets are for December of each year, whereas the ACT target is for September 2016. The number on ART in 2014 is the actual number reported.  
 Source: MOHSW, Unpublished[b].

monitoring, and delivery, including using bottom-up approaches for target setting and more frequent reporting from subnational levels.

### Pediatric ART Targets

The NACP and PEPFAR plan to rapidly scale up pediatric ART over the next two years, which will require responding to the challenges identified above. PEPFAR aims to support 77,256 children on ART by the end of the ACT initiative in September 2016 (see Figure 2) (US Department of State, 2015). By the end of FY 2015, PEPFAR-supported sites reported 54 percent achievement of this goal, indicating Tanzania is generally on-track to meet this target (PEPFAR, 2016). In consultation with PEPFAR, the NACP has set year-end annual targets for pediatric ART up to 2017 in the ACT strategy and up to 2020 in its National Performance Framework. The performance framework was developed with the goal of achieving the Joint United Nations Programme on HIV/AIDS (UNAIDS) 90-90-90 target of having at least 81 percent of all people living with HIV on treatment by 2020. By the end 2016, the NACP aims to have 80,504 HIV-positive pediatric clients ages 0–14 years enrolled on ART—about double the number on ART as of December 2014 (MOHSW, Unpublished[b]). Updated projections for

the number of people living with HIV were calculated by entering ART targets for all ages into the 2015 Spectrum AIM model for Tanzania. The updated projections estimate that the number of children living with HIV will decline over time due to anticipated increases in PMTCT coverage and effectiveness (due to the move from Option B to Option B+). By 2018–2020, the NACP aims to enroll 100 percent of HIV-positive children ages 0–14 on ART, which exceeds the UNAIDS 90-90-90 target. In 2020 alone, achieving this ambitious target could save the lives of an additional 415 children and adolescents ages 0–14 in comparison with a scenario in which the number of children on ART remains constant between 2014 and 2020.

### Select Resource Requirements to Meet Pediatric ART Targets

**Quantitative methodology:** Most assumptions for the cost analysis came directly from the NACP. Estimates of the unit costs of first- and second-line pediatric ARV regimens, the percentage of patients receiving each regimen, weighted average unit costs per laboratory test, and the failure rates of first-line treatment were derived from ARV and lab quantification exercises conducted by the NACP in July 2015. HPP estimated total laboratory

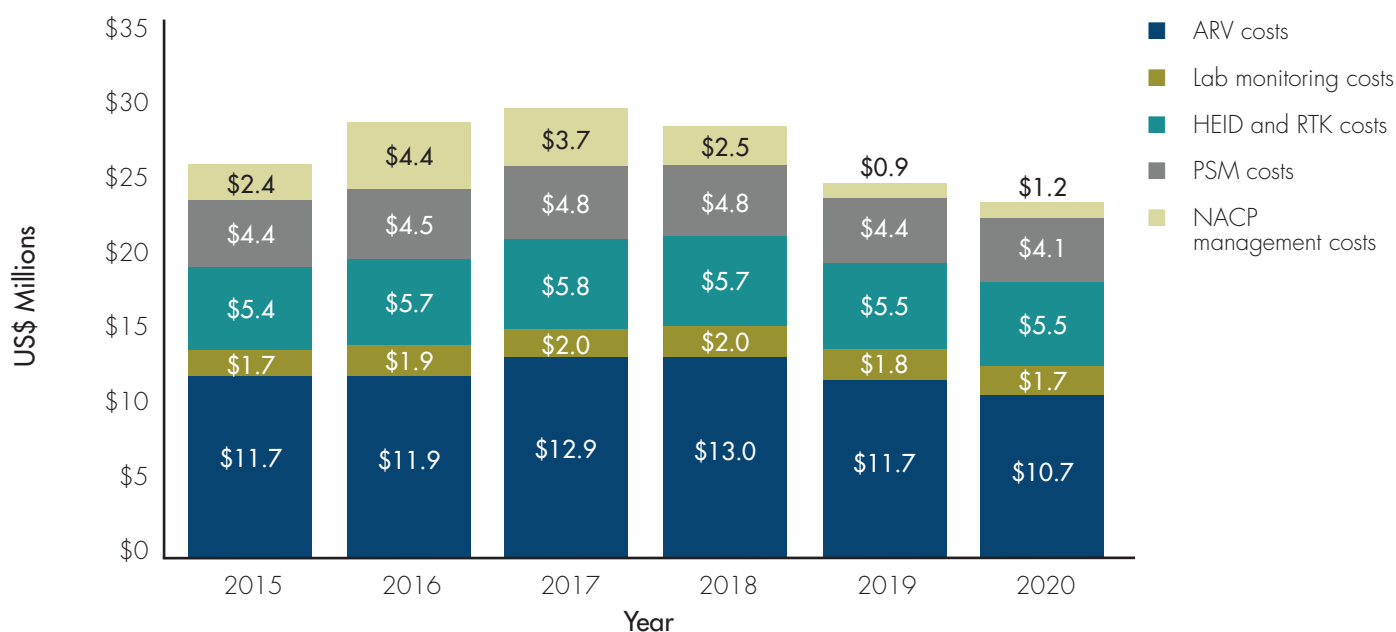
monitoring commodity costs based on the frequency of each test needed per patient, the number of patients per year, and the average unit cost per test. For RTK costs, HPP estimated the number of children to be tested based on the NACP’s annual provider-initiated testing targets and the proportion of children living with HIV. The pediatric ART targets decrease over time due to declines in the proportion of children living with HIV relative to all people on ART, but may still be ambitious, as identifying children will become increasingly difficult with the planned scale-up of PMTCT. Procurement and supply chain management (PSM) includes the cost of freight, clearance, quality assurance, storage, and in-country distribution of commodities. The NACP calculates PSM by taking 24.6 percent of the product cost. NACP pediatric ART program management costs came from the costing of the Third Health Sector HIV and AIDS Strategic Plan (HSHSP III) and Fourth Health Sector Strategic Plan (HSSP IV). Site-level overhead and personnel and subnational program management costs are excluded from the analysis due to the lack of available data.

To meet the NACP’s pediatric ART targets, an estimated US\$159 million is needed for commodities, PSM, and NACP program management from 2015 to 2020 (see

Figure 3). Commodity costs represent 74 percent of the total costs, with annual commodity costs peaking in 2018 due to the number of children ages 0–14 expected to be on ART that year. One-fifth (21%) of total resource requirements are for diagnostic commodities, which include the costs of HEID commodities and RTKs. ARVs are the largest cost category, accounting for 45 percent of total pediatric ART resource requirements. The average pediatric ARV cost per patient-year is anticipated to decline slightly, from US\$163 in 2015 to US\$141 in 2020, due to changes in the proportion of patients receiving particular regimens over time. Laboratory monitoring commodity costs, which include the costs of reagents, consumables, shared lab supplies, quality control, and wastage for hematology, clinical chemistry panel, CD4 count, and viral load testing, are just 7 percent of total pediatric ART resource needs.

The PSM requirements from 2015 to 2020 are US\$27 million. The NACP’s pediatric ART program management costs total US\$15 million over the same period (MOHSW, 2015a; Barker et al., 2015). These costs include the cost of conducting pediatric HIV surveillance, training healthcare workers on pediatric HIV, conducting rotating joint pediatric supportive supervision visits, and other program management activities. These activities aim to

**Figure 3.** Annual Costs of Meeting the NACP’s Pediatric ART Targets



Source: Authors’ estimates

directly address challenges along the pediatric treatment cascade by strengthening coordination and improving service quality.

Commodity, PSM, and national program management costs likely represent a significant portion of the overall resource requirements for pediatric ART. However, to meet ambitious pediatric ART scale-up targets, Tanzania will require resources for additional activities to address issues along the treatment cascade, and for other critical investment areas such as health worker salaries and facility and equipment maintenance.

### Funding for Pediatric ART

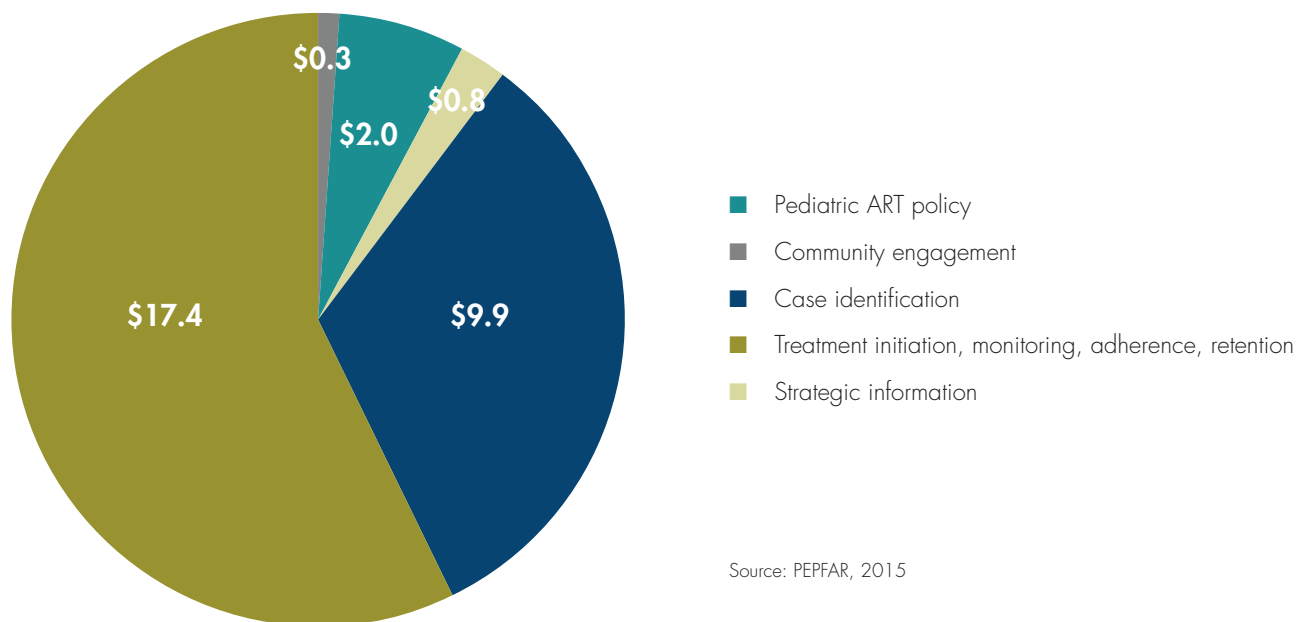
Tanzania is receiving pediatric ART funding support primarily from PEPFAR through its Country Operational Plan (COP); ACT; and the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund). Other external sources, such as the United Nations Children’s Fund (UNICEF), also provide some support for pediatric ART. The government of Tanzania contributes to pediatric ART by paying a portion of the PSM costs for pediatric ART commodities, as well as some of the human resource and infrastructure costs needed to deliver pediatric HIV services. ACT funding complements these investments. For instance, the Global Fund has

capped support for pediatric ART commodities, but ACT funding will fill the commodity gap for 2015 and 2016 (US Department of State, 2015).

Due to a lack of detailed data on pediatric ART funding from all sources, we were unable to estimate the pediatric ART funding gap. However, ACT funding accounts for approximately half of the total estimated resource requirements for pediatric ART commodities, PSM, and program management in 2016 and 2017. The largest proportion of ACT funding is for treatment initiation, monitoring, adherence and retention (57%), followed by case identification (33%) (see Figure 4) (PEPFAR, 2015).

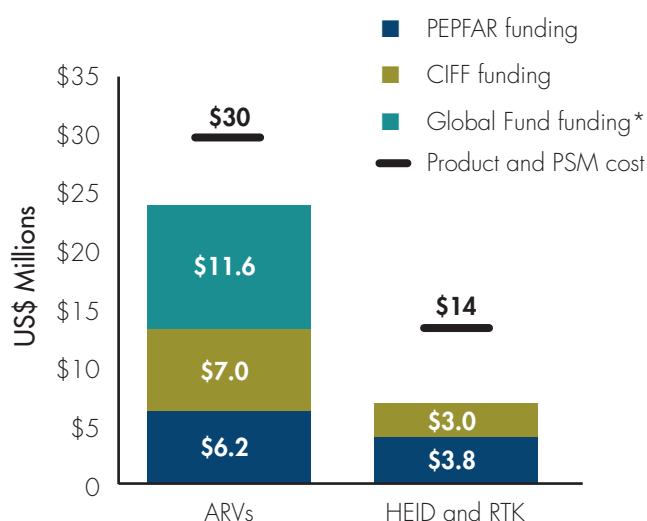
The majority (88%) of ACT funding for case identification and treatment initiation, monitoring, adherence, and retention will be used to procure pediatric ART commodities. Under ACT, PEPFAR and CIFF are contributing 43 percent of total pediatric ARV needs and 48 percent of total HEID and RTK needs, inclusive of PSM costs, for 2016 and 2017 (see Figure 5). Still, the Global Fund procures the majority of pediatric ART commodities in Tanzania. In FY 2015 alone, the Global Fund is procuring US\$11.6 million in pediatric ARVs. The exact funding for pediatric ARVs from the Global Fund for FY 2016 is unknown, but it is anticipated to cover all remaining treatment needs

**Figure 4.** ACT Funding in US\$ Millions (FYs 2015 and 2016)



Source: PEPFAR, 2015

**Figure 5. Pediatric ART Commodity Funding (FYs 2015 and 2016) vs. Commodity Costs (FYs 2016 and 2017)**



\*FY 2015 funding only, as FY 2016 is unknown.  
 Note: ACT commodity procurement spans December 2015 to June 2017. Therefore, funding is compared to projected costs in 2016 and 2017.  
 Source: MOHSW, Unpublished[a]

(~US\$5.7 million). If PMTCT targets are met, resulting, as projected, in declines in the number of children living with HIV, FY 2015 levels of support from the Global Fund for pediatric ARVs from 2017 to 2020 would cover 78 percent of pediatric ARV and PSM funding needs from 2017 to 2020.

Several implementing partners are receiving funds to carry out ACT activities at the national and district levels. The NACP is receiving ACT funds to coordinate and monitor ACT activities (PEPFAR, 2015). During ACT implementation, the NACP aims to mobilize additional resources for pediatric ART to ensure gains are sustained following the completion of ACT.

ACT activities aim to address programmatic challenges that have thwarted progress in scaling up pediatric ART in the past (see box above). For instance, as noted by implementing partners, the lack of data on linkage to and retention in care is a major challenge. The development of a centralized national DNA PCR database and PCR dashboard will allow for improved patient tracking and targeting of interventions.

Challenges	ACT-funded Solution
Commodity stockouts	Procure HEID commodities, RTKs, and ARVs
Insufficient human resources	Hire nurses, second staff to NACP
Poor tracking systems	Develop a centralized national DNA PCR database and dashboard
Lack of patient support	Form teen peer groups

## Conclusion

Scaling up ART among children ages 0–14 is crucial if Tanzania is to meet UNAIDS 90-90-90 treatment targets. Under ACT, Tanzania aims to accelerate pediatric ART coverage over the next two years. The NACP aims to double the number of children ages 0–14 on ART between 2014 and 2016 and to achieve 100 percent coverage by 2018. Achieving this ambitious target will require significant financial resources and investments in strengthening the pediatric treatment cascade. Additional data collection and analysis is needed to understand ART costs and implementation challenges, particularly for adolescents ages 15 and older, and to estimate the pediatric ART funding gap.

Our analysis of ACT funding indicates that ACT currently supports 45 percent of pediatric ART commodity procurement requirements for 2016 and 2017, which the government of Tanzania, the Global Fund, or another funding source, will need to assume following the completion of ACT. Further, additional investments may be needed after 2017 to address recurring and new challenges along the pediatric treatment cascade, particularly the cost of identifying children who may be hard to reach due to estimated declines in the number of children living with HIV. A sustainability plan should be developed to ensure pediatric ART gains are maintained past 2016, and that challenges along the pediatric ART cascade are adequately addressed. Tanzania will likely need to mobilize additional financial resources and consider more efficient pediatric ART service delivery models to achieve cost savings.

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<sup>1</sup> The World Health Organization defines children as people under 10 years of age and adolescents as people ages 10–19 years. Our quantitative analysis defines children as people ages 0–14, in line with the NACP definition, and uses the terms "pediatric" and "children" interchangeably. Our qualitative analysis includes components for children and adolescents ages 0–19.

<sup>2</sup> In Tanzania, ACT is known as the Tanzania Initiative for Accelerating Children on HIV Treatment (TI-CoT). To be consistent, this brief uses "ACT."

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