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## Family testing: an index case finding strategy to close the gaps in pediatric HIV diagnosis

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### Abstract

Despite significant advances in pediatric HIV treatment, too many children remain undiagnosed and thus without access to lifesaving antiretroviral therapy (ART). It is critical to identify these children and initiate ART as early as possible. While the children of HIV-infected adults are at higher risk of infection, few access HIV testing services due to missed opportunities in existing case finding programs. Family testing is an index case finding (ICF) strategy through which HIV-infected patients are systematically screened to identify family members with unknown HIV status. By specifically targeting a high-risk population, family testing is a pragmatic, high-yield,

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and efficient approach to identify previously undiagnosed HIV-infected children and link them to care before they become symptomatic. Despite this, incorporation of family testing into national guidelines and implementation of this case finding approach is variable. In this paper, we review the evidence base for family testing, describe its challenges, and provide guidance and sample tools for program managers aiming to integrate family testing into existing health systems.

## Introduction

Improved Prevention of Mother To Child Transmission of HIV (PMTCT) programs and the roll-out of universal antiretroviral treatment have resulted in a significant decrease in the number of children living with HIV.<sup>1</sup> Strengthened Early Infant Diagnosis (EID) programs, the implementation of international and national guidance to address specific needs of children living with HIV, and improved formulations for pediatric antiretroviral therapy have improved access to and quality of pediatric HIV treatment. Despite these advances, however, in 2013 only 24 percent of the estimated 3.2 million children living with HIV were on antiretroviral therapy (ART).<sup>2</sup> Half of these children would die before their second birthday without ART.<sup>3</sup> Among children on ART, up to two-thirds were diagnosed late and began treatment with severe immunodeficiency.<sup>4</sup>

The Accelerating Children's HIV/AIDS Treatment Initiative (ACT) responded to these shortcomings in pediatric diagnosis and treatment. Implemented from 2014 to 2016 with funding from the US President's Emergency Plan for AIDS Relief (PEPFAR) and the Children's Investment Fund Foundation (CIFF), ACT was a \$200 million initiative to accelerate the ART coverage of HIV-infected children and adolescents in Sub-Saharan Africa. The third pillar of the ACT initiative focused on systematically improving HIV case identification among children through strengthening EID, index case finding (ICF), and provider-initiated testing and counseling (PITC) in priority pediatric services.<sup>5</sup> With an intensified global emphasis on pediatric case finding, the proportion of children on ART globally increased to 43 percent in 2016.<sup>1</sup> Despite this progress, novel, high-yield approaches to case-finding are urgently needed to reach the 57 percent of HIV-infected children still not on ART.

Despite facing a higher risk of HIV infection, many children of HIV-infected adults have not been tested.<sup>6,7</sup> Family testing is an ICF approach wherein patients enrolled in ART programs are screened for untested family members, and it may be an efficient strategy to increase the diagnosis of perinatally-infected children.

(see Box 1: key points)

## Background

Case identification is a critical step in preventing morbidity and mortality from HIV infection. Traditionally, EID and PITC have been the cornerstone of case identification in children. While these approaches successfully identify a substantial proportion of children living with HIV, gaps in case finding persist and HIV-infected children remain undiagnosed.

### **Gaps in Case Finding with EID**

As the vast majority of pediatric HIV cases are due to vertical transmission, EID programs play a critical role in identifying HIV-infected children before they become symptomatic. While PMTCT has improved significantly over the past several years, allowing for increased enrollment of HIV-exposed infants into EID programs, gaps persist: lack of universal ART coverage of HIV-infected mothers, late incident infection among pregnant and breastfeeding women, and mother-infant pairs lost to follow up that result in ongoing HIV transmission and missed opportunities for case finding.<sup>6-10</sup> Once children age out of EID programs, opportunities for systematic HIV screening among healthy children are rare.

### **Gaps in Case Finding with Provider-Initiated Testing and Counselling (PITC)**

PITC refers to HIV testing initiated by a health worker, typically at a health facility. This can take many forms, from routine opt-out testing for all patients to targeted testing of sick patients with symptoms suggestive of AIDS. PITC is a critical component of the larger care cascade, though significant shortcomings limit its utility for pediatric case finding. Health workers are reluctant to offer testing to children, especially if they are asymptomatic, due to misperception of risk or concerns regarding consent.<sup>8</sup> Pilot studies of universal pediatric testing at venues such as immunization clinics have been promising, but are resource-intensive and dramatically increase the burden on counselors.<sup>9</sup> The relatively low HIV prevalence among children and the large number accessing immunization clinics may limit the feasibility and value of this approach in some settings.<sup>10</sup>

In addition, as children age, their utilization of primary health services where PITC can be delivered declines and orients instead around sick visits and inpatient admissions. As a result, the majority of children identified through PITC are already acutely ill when diagnosed,<sup>11</sup> and almost all missed earlier opportunities for diagnosis.<sup>8</sup> Other barriers to optimized PITC include lack of child-friendly services and variable interpretation of PITC guidelines.<sup>12</sup>

### **Index Case Finding is a potential solution to fill these gaps**

EID and PITC are critical approaches; however, alone they are insufficient in closing the pediatric HIV case finding gap. Less than half of HIV-infected children are on treatment, and of those who have initiated ART up to 63 percent in lower middle-income countries were already severely immunocompromised upon initiation.<sup>3,10</sup>

Even in optimized systems, children fall through the cracks. The likelihood of early diagnosis without supplemental case finding is low, and without treatment, presentation with symptomatic illness or advanced stage disease is more likely and risk of death increases. In one region of Harare, Zimbabwe—where PMTCT and EID outcomes are relatively strong—a community survey after several years of implementation of routine facility-based opt-out pediatric PITC found that over a third of HIV-infected children remained undiagnosed, and that PITC identified only 29 percent of previously undiagnosed children.<sup>13</sup> Thus, reliance on facility-based PITC alone, even when well-implemented, may miss a majority of children and identify only those who have already developed symptomatic disease. A realistic, systematic approach to pediatric case finding is therefore necessary, one that recognizes the

inherent shortcomings of imperfect systems and deploys pragmatic, high-yield strategies in response.

ICF is a WHO-endorsed approach in which contacts of an HIV-infected individual (the “index” case) are offered HIV counseling and testing. For the children of HIV-infected adults, this approach is generally referred to as family testing.

## Family testing

Family testing is a type of index case finding in which HIV testing is offered to sexual partners as well as other family members of an HIV-infected patient, including siblings and parents of HIV-infected children. In this approach, index cases can be adults or children. Family testing is a pragmatic, high-yield, and acceptable approach to close the diagnosis gap among children by identifying those missed by EID and PITC programs and to reach children living with HIV before they become ill.

The children of HIV-infected adults have a higher risk of infection,<sup>14</sup> and up to 65 percent of undiagnosed children have a family member already enrolled in an ART program.<sup>8,11</sup> Despite this concentration of risk, screening of active cohorts of ART clients for untested family members and notification for testing at baseline is poor—among children of HIV-infected mothers, often less than half (and as low as 10%) access testing services.<sup>7,15-17</sup> These children can be screened, diagnosed and treated earlier by systematically screening HIV-infected patients, and integrating systems for appropriate case finding and referral.

### Family testing is an effective method for identifying children living with HIV

Family testing of children consistently demonstrates a higher yield of new diagnoses compared to other modalities due to its targeting of a high-risk population. In Kenya, yield of testing was 7.4 percent—higher than both the general population and what would be expected in EID with effective PMTCT—and the majority of children were asymptomatic at the time of diagnosis with a median CD4 of 666.<sup>6</sup> Serial reports from Kenyan districts that have implemented family testing indicate a declining yield over time (18% in 2009 to 5.4% in 2015), yet even the lowest yield is over three-fold higher than pediatric PITC at the same facilities.<sup>18-20</sup> In Malawi, more than two-thirds of index patients enrolled in ART were found to have an untested child, and of these four percent tested positive, more than twice the estimated prevalence for this age group.<sup>21</sup> Family testing of children also promotes uptake of HIV testing across the family unit.<sup>22</sup>

Family testing should be offered to any child with unknown HIV status whose parent or sibling is the index patient, regardless of the child’s age. The limited disaggregation of results by age among studies of family testing makes interpretation of yield by age category difficult. In Uganda, uptake and yield were both higher in the five and under group compared to the 6-14 group; however, analysis of yield was not conducted according to age categories.<sup>23</sup> The very limited data comparing testing yields for children who are and those who are not biologic offspring or siblings of the index patient suggest similar yields for the two groups,<sup>21,23</sup> potentially due to the unique risks to which children living outside of the nuclear family are exposed. More evidence is needed before routine inclusion of children

without direct biologic relationship to the index patient can be recommended as a routine component of index testing programs.

### **Barriers in implementing family testing**

Family testing requires active participation from providers and index patients, from the point of screening index patients for family members with unknown status, to linking newly-identified HIV-infected child contacts to treatment (Fig 1). Implementation studies have demonstrated highly variable rates of attrition across the ICF cascade. In Kenya, of 611 index patients with a child of unknown status, only 74 (12%) completed testing for their child. The reason for falling out of the cascade for 83 percent of index patients was declined participation.<sup>6</sup> An earlier study in Kenya found that among children of ART patients identified during screening, only one-third accessed testing, and of those found positive, 36 percent initiated ART.<sup>19</sup>

Results from Malawi are more promising, with 94 percent of eligible index patients consenting to family testing. Index patients were offered a choice between home- and facility-based testing, with a majority (88%) opting for home-based testing. Among children found to be positive, 77 percent were enrolled into HIV care.<sup>21</sup> This high rate of linkage may be a reflection of the study's implementation as part of a robust community health worker platform with a strong track record for pediatric diagnosis and linkage to care.<sup>24</sup> Preliminary results from Cameroon also demonstrated excellent acceptability, with 100 percent of eligible adults consenting. Index patient preference for testing location differed, however, with 93 percent opting for facility-based testing—almost the opposite of that reported in Malawi.<sup>25</sup>

Reported rates of uptake of HIV testing of children are highly variable, ranging from 19 percent to 94 percent.<sup>6,18-23,25,26</sup> Currently available evidence is limited in explaining this variability. It is plausible that testing location may affect uptake. In a randomized trial in Uganda including all household members, home-based testing was associated with a ten-fold higher rate of uptake compared to facility-based testing, an effect that was even greater in child contacts.<sup>23</sup> Of note, the two studies with the highest acceptance rates (Malawi and Cameroon) offered clients a choice of testing location. While the venue patients chose in these studies differed, the simple ability to choose may mark a patient-centered approach that improves testing uptake.

Future studies on barriers to testing specific to this approach are needed for programs to optimize uptake, however lessons may be drawn from the existing literature describing general barriers to pediatric testing. These barriers fit into several thematic categories: individual, caregiver, health system, and policy/legal barriers. Barriers include attitudes and language exhibited by health care workers, index patients feeling unprepared to disclose own status to children/partner, avoidance of blame, guilt, and stigma, and fear of positive results (Table 1).<sup>30,31</sup>

### **Need for systematic and ongoing family testing**

Embracing family testing as a routine, ongoing assessment of HIV status rather than a one-time referral is critical to optimizing uptake and limiting attrition across the cascade. A

systematic assessment of ART patients' family contacts and repeat referral as new contacts are identified is associated with high uptake.<sup>18,21</sup> At each clinic visit, contacts of index clients who have tested negative should be evaluated for ongoing risk according to national HTS guidelines and be offered retesting as needed. Use of dedicated tools to map family members that include each individual's HIV status is critical to implementation, and is associated with higher rates of index screening and family testing, along with linkage to care for newly diagnosed children.<sup>18,21,26,27</sup>

## Current policy guidelines

While further research will help optimize family testing programs, the available evidence suggests that family testing is an efficient, high-yield intervention which should be leveraged to close the gap in pediatric case finding. Despite recent global guidance (Table 2) emphasizing the importance of index testing, current country guidelines vary in the amount of detail they include regarding index case finding strategies for children, as well as in policies around consent, which directly impact the uptake of index case finding for children (Table 3).

## Novel approaches/future directions

Assisted partner notification is a well-established, effective, and safe approach to promote testing of HIV-exposed contacts and involves active participation of the health provider in disclosure and invitation of contacts for testing. Integration of family-linked testing for children into existing assisted partner notification programs for adults may be pragmatic and efficient for leveraging the existing notification platform to prioritize testing of another high-risk population—the children of index cases. The one study that has examined the feasibility of this approach demonstrated a low yield (2%), but almost 100 percent acceptance rate,<sup>28</sup> warranting further investigation of this strategy. Self-testing is a promising approach to increase uptake of testing among contacts of index patients, and may promote testing of children, especially with the use of less invasive oral tests; however, no evidence describing this approach is available.

## Recommendations, future research

Gaps in traditional pediatric case finding approaches limit progress towards the 90-90-90 goals for children. Family testing is a high-yield and promising approach to diagnose children who fall through the gaps in traditional case finding programs, and should be integrated into routine programming to ensure children are not missed. We recommend that all countries define a policy for family testing in their national guidelines that includes, at a minimum, active screening of HIV-infected clients for family members with unknown HIV status and follow-up for testing, with linkage to care for newly identified HIV-infected persons. To facilitate implementation, guidelines should outline a minimum standard package of tools, standard operating procedures (SOPs), and guidance. The complexity of the intervention may vary by country and implementer, but systematic screening and referral for testing should be ensured.

A comprehensive family testing package may include the following components:

1. Clear **definition** of an index patient as any HIV-infected person, including adults, adolescents, and children. All should be screened for untested contacts requiring referral for testing, including parents, children, siblings, sexual partners, and drug-injecting contacts.
2. Clearly defined **policies for assent, consent, and disclosure** for children, with tools to train providers in these concepts, including child-friendly health services, and ongoing monitoring to ensure correct implementation.
3. **Behavior change communication** strategies to improve community understanding of HIV risk among children and the importance of family index testing and timely linkage to care for HIV-infected individuals.
4. **Toolkit** (refer to Supplemental Digital Content Annex 1 for examples):

- Family Testing Screening Form: A simple tool to facilitate active screening of index clients for untested contacts.

A screening tool is best incorporated into existing ART clinic patient records, but in cases where this is not possible, it may be included as part of a discrete screening tool. Most effective if the contact information is located where it is easily reviewed at every index client visit. Includes the following information:

- Index Patient: name, locator information, # children, # sexual partners
- For each identified contact: HIV status, test dates, ART status
- Additional considerations:
  - Include location preference for testing (home vs facility)
  - Include a pre-identified appointment date for contacts to return for testing

- Family Testing Register and Monthly Report: A register and monthly report to monitor performance along the family testing cascade from HIV testing to ART initiation for positives. Routine reporting should include a clearly defined family testing cascade. Countries may choose to utilize a specific index testing register or to incorporate the information into existing HTS registers, but should at a minimum track the following information:

- Number of index patients
- Number of contacts
- Number of contacts with known vs unknown status
- Number of contacts tested
- Number of contacts diagnosed with HIV

- Number of HIV+ contacts started on ART
  - Script to support disclosure to/invitation of contacts:
    - A sample disclosure script empowering a patient to bring contacts for testing facilitates comprehensive, consistent delivery of counseling to index patients and may help improve contacts' return for testing.
  - Standard Operating Procedure for Family Testing and Linkage to Care:
    - An SOP outlining processes and tools assists program managers with streamlined implementation from screening through linkage of positives.

In some settings, delivery of a comprehensive family testing package may require stepwise implementation; however, countries should, at a minimum, aim to urgently implement a family testing model in which all HIV-infected patients are screened at least once to identify children of unknown status using a simple family screening tool maintained as part of the active ART client record.

Given the sensitive nature of HIV testing, family testing approaches should be implemented carefully and in close collaboration with civil society partners. The complex issues of confidentiality, stigma, and disclosure that arise from HIV testing for children must be considered, and this approach cannot succeed at scale unless it is implemented in a manner that supports families.

Future qualitative research to understand the widely variable uptake in testing for children described in implementation studies of index case finding may inform policy and practice to address barriers affecting uptake of testing among child contacts. Further investigation of the utility of assisted partner notification strategies for identifying both perinatally and horizontally infected youth may result in additional strategies to complement existing case finding approaches.

Finally, family testing programs must not be implemented in isolation, but rather as a critical component of a comprehensive package of pediatric case finding approaches. Continued strengthening of existing EID and PITC programs must be undertaken to ensure no children are left undiagnosed.

## Conclusions

Despite improvements in EID and PITC in recent years, significant numbers of HIV-infected children are not accessing lifesaving ART. Broad implementation of strategies like index family testing are urgently needed to diagnose these children and link them to care. By screening known HIV-infected persons for untested family members, family testing offers a pragmatic, high-yield, and efficient approach for resource-constrained health systems to reach these children and connect them to care before they become sick. To optimize uptake, programs should routinely and repeatedly screen all HIV-infected patients and refer any untested family contacts for testing. By supporting this approach with clear and concrete policy guidance, engaging civil society to ensure appropriate community support, and



empowering program managers to implement family testing models tailored to their country settings, national ART programs have an opportunity to close the gaps in pediatric case finding and ensure children do not fall further behind in reaching the 90-90-90 targets.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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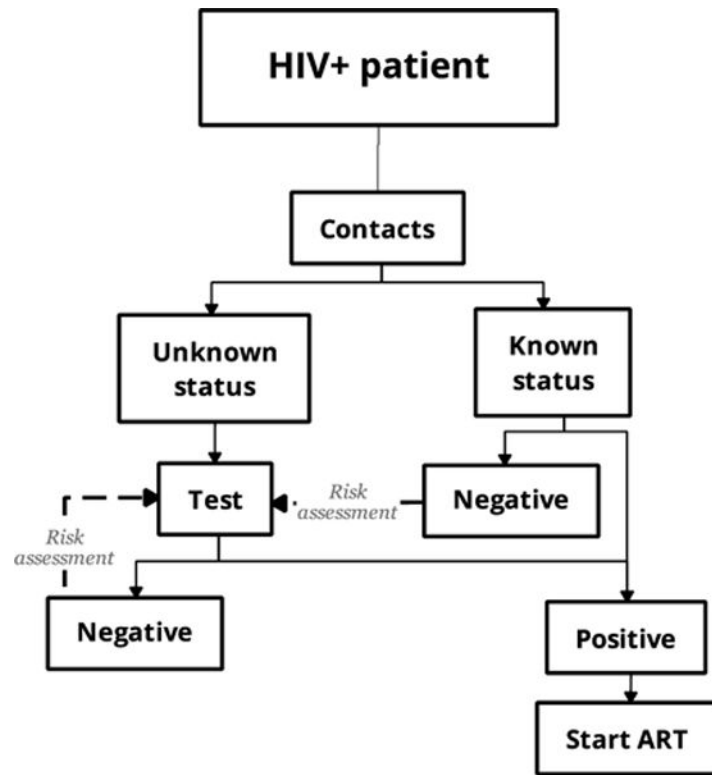
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**Box 1: Key points**

- Despite substantial improvements in EID and PITC program delivery, gaps in pediatric HIV diagnosis persist and HIV-infected children remain undiagnosed
- The children of HIV-infected adults are at greater risk for infection, but many do not access HIV testing services
- Family testing is an index case finding strategy whereby children, siblings, and parents of HIV-infected patients are targeted for testing by asking known HIV-infected patients about family contacts
- Yields from family testing are high, and often several times greater than PITC or estimated age-specific prevalence
- Some studies report low testing uptake among contacts of index patients, and future work is needed to better understand barriers
- Family testing is best implemented with a systematic approach to screening, referral, and linkage to care that is repeated at every ART clinic visit, and supported by pragmatic tools, SOPs, and guidance
- By embracing family testing, national HIV programs have an opportunity to help close the pediatric case finding gap and ensure HIV-infected children have timely access to ART



**Figure 1.**  
Family testing care cascade

**Table 1**

## Barriers to successful implementation of ICF strategies for children

Category	Frequently Identified Barriers
Individual	<p>Reliance upon caregiver to access HTS</p> <p>Higher likelihood of being orphaned / changing caregivers<sup>29,30</sup></p> <p>Lack of understanding of importance of HIV test</p> <p>Fear of stigma from friends and providers<sup>31,32</sup></p> <p>Fear of consequences of a positive test<sup>31,32</sup></p>
Caregiver-related (family/community)	<p>Fear of inadvertent disclosure of caregiver's status<sup>6,29,33</sup></p> <p>Sense of guilt, fear of blame<sup>6</sup></p> <p>Fear of stigma and discrimination associated with both accessing testing and a positive diagnosis<sup>6,29,30,34,35</sup></p> <p>Fear of positive result<sup>32,34</sup></p> <p>Logistical challenges of accessing services (e.g. affording transport, finding time off work)<sup>6,35</sup></p> <p>Negative clinic staff attitudes<sup>35</sup></p> <p>Child seems well to caregiver<sup>6</sup></p> <p>Disagreement or want to consult with partner over testing child<sup>6,30</sup></p> <p>Pessimism regarding HIV-infected children's prognosis<sup>6,33,34</sup></p> <p>Caregiver concerns about own emotional health if child is HIV-infected<sup>33</sup></p> <p>Perceived lack of support to cope with child's disclosure<sup>6</sup></p> <p>Challenges communicating about HIV with children<sup>33</sup></p> <p>Perceived costs of testing and care<sup>33</sup></p>
Health System Provider	<p>Discomfort/lack of experience with children<sup>33,35</sup></p> <p>Perception of children services as low risk<sup>33</sup></p> <p>Lack of understanding of assent, consent, and mature minor policies leading to avoidance of offering testing<sup>33,36</sup></p> <p>Increased complexity of counselling if positive<sup>37</sup></p> <p>Perceived unsuitability of accompanying guardian to provide consent<sup>8</sup></p>
Health System: Facility/Structural	<p>Staffing limitations<sup>6</sup></p> <p>Long queues<sup>35</sup></p> <p>Prioritization of HTC for other populations (e.g., ANC)<sup>8</sup></p> <p>Inconvenient clinic hours (interfere with school, guardian's work, etc)<sup>6,8</sup></p> <p>Physical Space – many facilities lack confidential, youth-friendly spaces<sup>8</sup></p> <p>Documentation – lack of systems/screening tools in place to track testing of family members</p>
Policy/Legal	<p>Lack of clarity/consistency around assent, consent policies<sup>8,37,38</sup></p> <p>Restrictive consent requirements<sup>37</sup></p> <p>Lack of health worker training in nuances of consent for mature minors (married, pregnant, sexually active, otherwise at risk for HIV)<sup>36</sup></p> <p>Lack of guidelines and tools/SOPs specifically targeting family testing to identify children</p>

Table 2

## Global Guidance

Global Guidance with mention of index testing approaches			
Title	Date	Summary of Recommendations	Link*
Policy Brief: WHO Recommends HIV Self-Testing	2017	<ol style="list-style-type: none"> <li>1 Recommends self-testing as an important additional approach to HIV testing services</li> <li>2 Provides recommendations for countries to establish safe, effective, successful programs</li> <li>3 No specific mention of child or family testing</li> </ol>	<a href="http://www.who.int/hiv/pub/vct/who-recommends-hiv-self-testing/en/">http://www.who.int/hiv/pub/vct/who-recommends-hiv-self-testing/en/</a>
US Guidelines for the Use of Antiretroviral Agents in Pediatric HIV Infection	2017	<ol style="list-style-type: none"> <li>1 Updated US care and treatment guidelines, focused primarily on care and treatment</li> <li>2 Includes section on EID testing with specific guidance on timing and series of virologic testing for infants</li> <li>3 Includes case finding recommendations for older children</li> </ol>	<a href="https://aidsinfo.nih.gov/guidelines/html2/pediatric-arv/0">https://aidsinfo.nih.gov/guidelines/html2/pediatric-arv/0</a>
Policy Brief: WHO Recommends Assistance for People with HIV to Notify their Partners	2016	<ol style="list-style-type: none"> <li>1 Recommends assisted partner notification services to identify sexual and drug-injecting partners of HIV-infected patients</li> <li>2 Includes definitions for partner notification</li> <li>3 Lack of clarity about age at which strategies should be used - only states that preferences for method used differ by population and must be carefully tailored to the client, "especially young people"</li> </ol>	<a href="http://www.who.int/hiv/pub/vct/who-partner-notification-policy/en">http://www.who.int/hiv/pub/vct/who-partner-notification-policy/en</a>



Global Guidance with mention of index testing approaches			
Title	Date	Summary of Recommendations	Link*
		<p><b>4</b> Emphasizes the importance of developing laws and policy to empower HIV-infected individuals and prevent stigma and discrimination</p>	
Guidelines on HIV Self-testing and Partner Notification: Supplement to Consolidated Guidelines on HIV Testing Services	2016	<p><b>1</b> 2016 update to HIV testing services guidelines providing additional guidance on HIV self-testing and assisted HIV partner notification services.</p> <p><b>2</b> Includes guidance on self-testing and partner notification for adolescents</p>	<a href="http://www.who.int/hiv/pub/vct/hiv-self-testing-guidelines/en">http://www.who.int/hiv/pub/vct/hiv-self-testing-guidelines/en</a>
Consolidated Guidelines on HIV Testing Services	2015	<p><b>1</b> Consolidates existing guidance relevant to the provision of HIV testing services (HTS) and addresses issues and elements for effective delivery of HTS that are common in a variety of settings, contexts and diverse populations; Includes approaches for children and adolescents.</p> <p><b>2</b> Recommends provision of HTS by trained lay providers, outlines focused and strategic approaches to HTS to support the UN 90–90–90 global HIV targets</p> <p><b>3</b> Assists national program managers and service providers in planning for and implementing HTS, including those from community-based programs</p>	<a href="http://www.who.int/hiv/pub/guidelines/hiv-testing-services/en">http://www.who.int/hiv/pub/guidelines/hiv-testing-services/en</a>

Global Guidance with mention of index testing approaches			
Title	Date	Summary of Recommendations	Link*
Adolescent HIV Testing, Counselling, and Care: Implementation Guidance for Health Providers and Planners	2014	<ol style="list-style-type: none"> <li>1 Highlights WHO recommendations on HIV Testing and Counselling (HTC) for adolescents</li> <li>2 Linkage recommended for adolescents from key pops in all settings; in generalized epidemics, HTC with linkage recommended for all adolescents, and in low/ concentrated epidemics HTC and linkage should be made accessible.</li> </ol>	<a href="http://www.who.int/maternal_child_adolescent/documents/hiv-testing-counselling/en">http://www.who.int/maternal_child_adolescent/documents/hiv-testing-counselling/en</a>
Consolidated Guidelines on Use of ARVs for Treatment and Prevention HIV Infection	2013	<ol style="list-style-type: none"> <li>1 Content on HTC for children and adolescents; routine testing of exposed infants at 4-6 weeks or serological screening for mothers/infants with unknown exposure status</li> <li>2 Serological testing of healthy HIV-exposed infants at 9 months and serological testing 6 weeks after cessation of breastfeeding.</li> <li>3 Virologic testing to confirm infection in positive infants under age of 18 months</li> </ol>	<a href="http://www.who.int/hiv/pub/guidelines/arv2013/en/index.html">www.who.int/hiv/pub/guidelines/arv2013/en/index.html</a>
HIV and Adolescents: Guidance for HIV Testing and Counselling and Care for Adolescents Living with HIV: Guidance Document	2013	1. Provides specific recommendations and expert suggestions for national policy-makers and program managers, partners and stakeholders on prioritizing, planning and providing HIV testing, counselling, treatment and care services for adolescents	<a href="http://www.who.int/hiv/pub/guidelines/adolescents/en">http://www.who.int/hiv/pub/guidelines/adolescents/en</a>
Planning, Implementing, and Monitoring Home-Based HIV Testing and Counseling: A	2012	<ol style="list-style-type: none"> <li>1 Practical handbook designed for Sub-Saharan Africa; focuses primarily on home-based services for adults</li> </ol>	<a href="http://www.who.int/hiv/pub/vct/home_based_care/en/index.html">www.who.int/hiv/pub/vct/home_based_care/en/index.html</a>

Global Guidance with mention of index testing approaches			
Title	Date	Summary of Recommendations	Link*
Practical Handbook for Sub-Saharan Africa		<ol style="list-style-type: none"> <li>Child and adolescent testing also included, as well as a table listing HIV signs and symptoms to prompt HCW to recommend testing</li> </ol>	
Service Delivery Approaches to HIV Testing and Counseling (HTC): A Strategic Policy Framework	2012	<ol style="list-style-type: none"> <li>Intended for clinical and community HIV and TB service providers, program managers and policy makers</li> <li>Covers PITC for children and adolescents, including how to expand beyond clinical facilities and set clear HTC targets</li> </ol>	<a href="http://www.who.int/hiv/pub/vct/htc_framework/en/index.html">http://www.who.int/hiv/pub/vct/htc_framework/en/index.html</a>
WHO Guidelines on HIV Disclosure and Counseling for Children Up to 12 Years of Age	2011	<ol style="list-style-type: none"> <li>Focuses on HIV status disclosure</li> <li>Assists HCW who support children &lt;12 yrs of age and their caregivers</li> <li>Includes information about disclosure counseling and HIV testing and care</li> </ol>	<a href="http://www.who.int/hiv/pub/hiv_disclosure/en/index.html">www.who.int/hiv/pub/hiv_disclosure/en/index.html</a>
HIV Testing for Young Children: Technical Brief	2011	<ol style="list-style-type: none"> <li>Provides a summary of key issues</li> <li>Overview of the 'why, when and where' of pediatric case finding</li> <li>Reflects WHO guidance on testing policy, technologies, diagnostic approaches, and disclosure strategies for children &lt;10 yrs</li> </ol>	<a href="http://www.who.int/hiv/pub/vct/WHO_HIV_11_02/en/index.html">www.who.int/hiv/pub/vct/WHO_HIV_11_02/en/index.html</a>
Operational Guidelines on HIV Testing and Counseling of Infants, Children, and Adolescents for Service Providers in the African Region	2011	<ol style="list-style-type: none"> <li>Overview of settings in which pediatric HTC can be optimally provided, including maternal health services, child health services, adult testing and</li> </ol>	<a href="http://apps.who.int/iris/handle/10665/192410">http://apps.who.int/iris/handle/10665/192410</a>

Global Guidance with mention of index testing approaches			
Title	Date	Summary of Recommendations	Link*
		<p>treatment services, home-based treatment programs, and programs for vulnerable children</p> <p><b>2</b> Recommends pediatric testing in all clinical services in generalized epidemics, and targeted testing strategies in concentrated epidemics</p>	
Policy Requirements for HIV Testing and Counseling of Infants and Young Children in Health Facilities	2010	<p><b>1</b> Designed for use by country programs as they develop pediatric HIV testing guidelines</p> <p><b>2</b> Outlines addressing key issues within national policy guidance to support country programming</p> <p><b>3</b> Includes a summary of selected WHO and UNICEF guidelines and policy guidance for pediatric HTC preceding 2010</p>	<a href="http://www.who.int/hiv/pub/paediatric/testing_counselling/en/">www.who.int/hiv/pub/paediatric/testing_counselling/en/</a>

\* All links accessed on 4 April, 2018

**Table 3**

Select, country-level guidelines and consent guidance

Country	Family-Linked Index Testing Guidance	Consent Guidance
Cameroon	Any infected parent treated in the management units or approved treatment centers must be offered free HIV testing for their offspring Partners of people living with HIV and family members of indexed cases should be screened <sup>39</sup>	Consent: Age 13 years for HIV testing Mature Minor: 14 years and sexually active or family head HIV screening of children in the community: consent of parent/legal guardian required and approval of Health District and/or Regional Delegation of Public Health
Kenya	Test all children of adults receiving any HIV service, those born of known HIV-infected mothers, and families of patients receiving care for HIV/AIDS-related illnesses through facility- or home-based index case testing Home-based testing and counseling services should focus on index clients' follow-up in households with known HIV-infected clients Home-based testing and counseling promotes partner and family testing [due to] potential of reaching children whose mothers are infected for testing <sup>40</sup>	Consent: Age 15 years for HIV testing (or emancipated minors irrespective of age) Assent: Those from age 7 years need to give assent after the parents give consent
Lesotho	"Family Tree Testing:" Ensure that all partners, children, and other household members of HIV-infected individuals have been tested for HIV Family members should be clearly documented in the index patient's medical record to allow for further follow-up Routinely ask HIV-infected individuals about HIV status of their sexual partners and children, and the statuses of these family members should be clearly documented in the index patient's medical record to allow for further follow-up <sup>41</sup>	Consent: Age 12 years for HIV testing If the health care provider determines that an adult or child is at risk of HIV exposure or infection, consent is not required, and the provider may initiate testing with the understanding that the individual maintains the right to opt out
Malawi	Children of HIV-infected parents are a priority group for HIV testing Using a HIV-infected parent as an index case is one of the most effective ways of finding [infected] children Index testing, also referred to as index case HIV testing, is a focused type of HIV testing service in which sexual partners as well as household and family members, including children and adolescents, of people diagnosed with HIV are offered HIV testing <sup>42</sup>	Consent: Age 13 years for HIV testing If a patient is unconscious or unable to give consent, such consent can be given by the spouse, next-of-kin or health care provider in cases where there is no guardian Mature minor: Married, pregnant, or sexually active can access HTS without a guardian
South Africa	It is important to integrate HIV testing into other child health programmes and to develop a systematic process to identify and prioritize high-yield testing among infants and children HTS for children and infants must encompass: early infant diagnosis (EID) for all HIV-exposed infants; testing all children of adults and siblings who are receiving HIV services; testing all children accessing services for orphans and vulnerable children (OVC), especially if a parent has died Testing the children of HIV-infected adults receiving any HIV service (e.g. HIV care and support, ART, PMTCT, and TB-HIV treatment) is an effective strategy for improving early case finding for HIV-exposed and HIV-infected children Family counselling can also facilitate disclosure and communication within the family and improve adherence and retention in HIV clinical care Health care providers should reinforce the need for partner and family testing at every clinic visit with an HIV-infected patient Family testing can be offered at the health facility or through home-based index case testing to improve children's access to HTC services HTC priority areas include testing of family members of HIV infected persons. <sup>43,44</sup>	Consent: Age 12 years for HIV testing Mature Minor: Child < 12 years with "sufficient maturity" If no guardian, the provincial head of the Department of Social Development may consent Assent: Where appropriate children may also provide assent
Swaziland	Family testing is a successful approach to reach clients who are not attending health facilities or outreach events A family testing approach involves utilizing the index patient (client testing at that time) to identify and bring HIV prevention, care and treatment services to family members that they are living with Each client tested should be encouraged to visit any testing point with their family, and anyone who is co-habiting with them <sup>45</sup>	Consent: Age 12 years for HIV testing Mature Minor: Children <12yrs may provide informed consent for HIV testing if they are considered a premature adult (i.e. are pregnant, are being treated for a sexually transmitted infection, are accessing family planning services, and/or are sexually active) Assent: Although adolescents may not give informed consent for testing, their agreement should be sought via age-appropriate counselling

Country	Family-Linked Index Testing Guidance	Consent Guidance
Tanzania	<p>HIV testing and counselling should be encouraged (health facility or community-based) for all partners and children of index clients and linkage to prevention, care and treatment services as appropriate</p> <p>Facility- and community-based index client testing should be offered from all facilities</p> <p>Targeted community-based HTS is useful for children and partners of index clients, adolescents, and family index testing.<sup>46</sup></p>	<p>Consent:</p> <p>Age 16 years for HIV testing</p> <p>Mature minors: &lt;16 years, married, have children, or sexually active</p> <p>Reporting of test results for youth &lt;18 years: results reported to parent or guardian, including mature minors, even if youth did not require guardian consent for testing</p>
Uganda	<p>Index contact tracing: the index client is used to help identify subsequent clients for testing. Index testing should be prioritized for household members of all HIV-positive individuals in care as well as confirmed and presumptive tuberculosis patients <sup>47</sup></p>	<p>Consent:</p> <p>Age 12 years for HIV testing</p> <p>In situations where consent cannot be obtained, the parent or guardian (of a child), next of kin, or legally authorized person should consent</p>
Zambia	<p>A family-based approach to HIV testing services encourages testing of all children and adolescents of unknown HIV status in the community and at the health facility irrespective of individual risk factors</p> <p>HIV testing and counselling should be encouraged for HIV-exposed infantsexposed infants, all infants and children with unknown HIV status admitted for inpatient care, attending malnutrition clinic, outpatient care or immunization clinics, all sexually active persons 10+ years with their partners and any person of unknown HIV status</p> <p>HIV testing services should be done at all service delivery points within the facility, as well as in the community, as an efficient and effective way to identify people with HIV</p> <p>Community-based testing embraces a family-centered approach based on the index-patient model and leads to early diagnosis of HIV infection and prompt linkage to care and treatment</p> <p>Every individual in the index= patient's home, regardless of age and risk factors, should be tested with a serologic test, also known as antibody test or rapid test</p> <p>All individuals testing negative should re-test after 3 months (to account for the window period) <sup>48</sup></p>	<p>No language on consent/assent</p>