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## Abbreviations

AIDS – Acquired Immune Deficiency Syndrome  
ART – Antiretroviral Therapy  
ARV – Antiretroviral medication  
DRC – Democratic Republic of Congo  
HIV – Human Immunodeficiency Virus  
HIVDR – HIV Drug Resistance  
LMICs – Low- and Middle-Income Countries  
MMD – Multi-Month Dispensation  
MoH – Ministry of Health  
MSM – Men who have Sex with Men  
MTCT – Mother-To-Child Transmission

NNRTIs – Non-Nucleoside Reverse Transcriptase Inhibitors  
NRTIs – Nucleoside/Nucleotide Reverse Transcriptase Inhibitors  
PEP – Post-Exposure Prophylaxis  
PEPFAR – President's Emergency Plan For AIDS Relief  
PITC – Provider-Initiated HIV Testing and Counseling  
PLWHA – People Living With HIV and AIDS  
PMTCT – Prevention of Mother-To-Child Transmission  
PrEP – Pre-Exposure Prophylaxis  
PWID – People Who Inject Drugs  
SSA – Sub-Saharan Africa  
SW – Sex Workers

## Prevalence

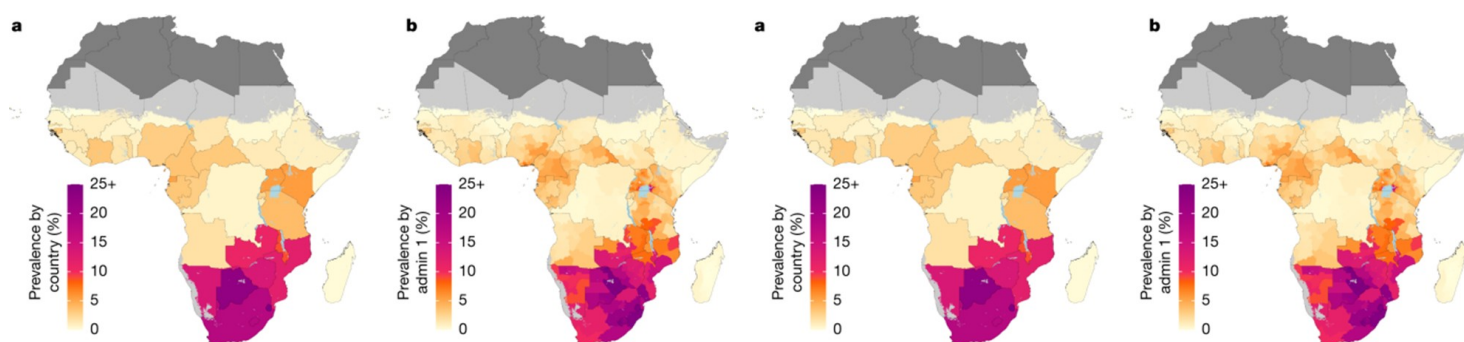
### HIV/AIDS: The Principal Cause of Indisposition in SSA

HIV/AIDS is a leading cause of morbidity and mortality in SSA<sup>1</sup>, as evidenced by 71% of HIV-infected people, 75% of deaths and 65% of new infections being in Africa in 2017<sup>2</sup>. There are wide variations in HIV prevalence in Africa, ranging from countries with a relatively high overall prevalence to moderate and low overall prevalence.

Botswana is one example of a country with a relatively high national prevalence of 22.8%, with the prevalence among its districts ranging from 15.1% to 27.7% in 2017. The national prevalence in Tanzania was moderate at 3.9%, with its regional prevalence ranging from 0.4% to 9.1% and the national prevalence of DRC was low at 0.7%, with regional differences ranging from 0.3% to 1.4%.

In 2018, there were approximately 37.9 million PLWHA globally; the African region had 25.7 million PLWHA<sup>3</sup>. This accounts for two thirds of the global total HIV infections. Key populations (MSM, SW and PWID) and their partners particularly accounted for more than half (an estimated 54%) of new infections in 2018<sup>3</sup>.

Figure 1 below demonstrates the HIV prevalence in Africa in 2017. The prevalence exceeded 10% in Southern SSA countries, which is higher than other countries in the continent. However, countries such as Kenya, Tanzania, Uganda, and Malawi also had a high prevalence exceeding 10%. Generally, the highest recorded prevalence in 2017 was 27.2% in Swaziland.



**Figure 1: Prevalence of HIV among adults (15–49) in 2017**

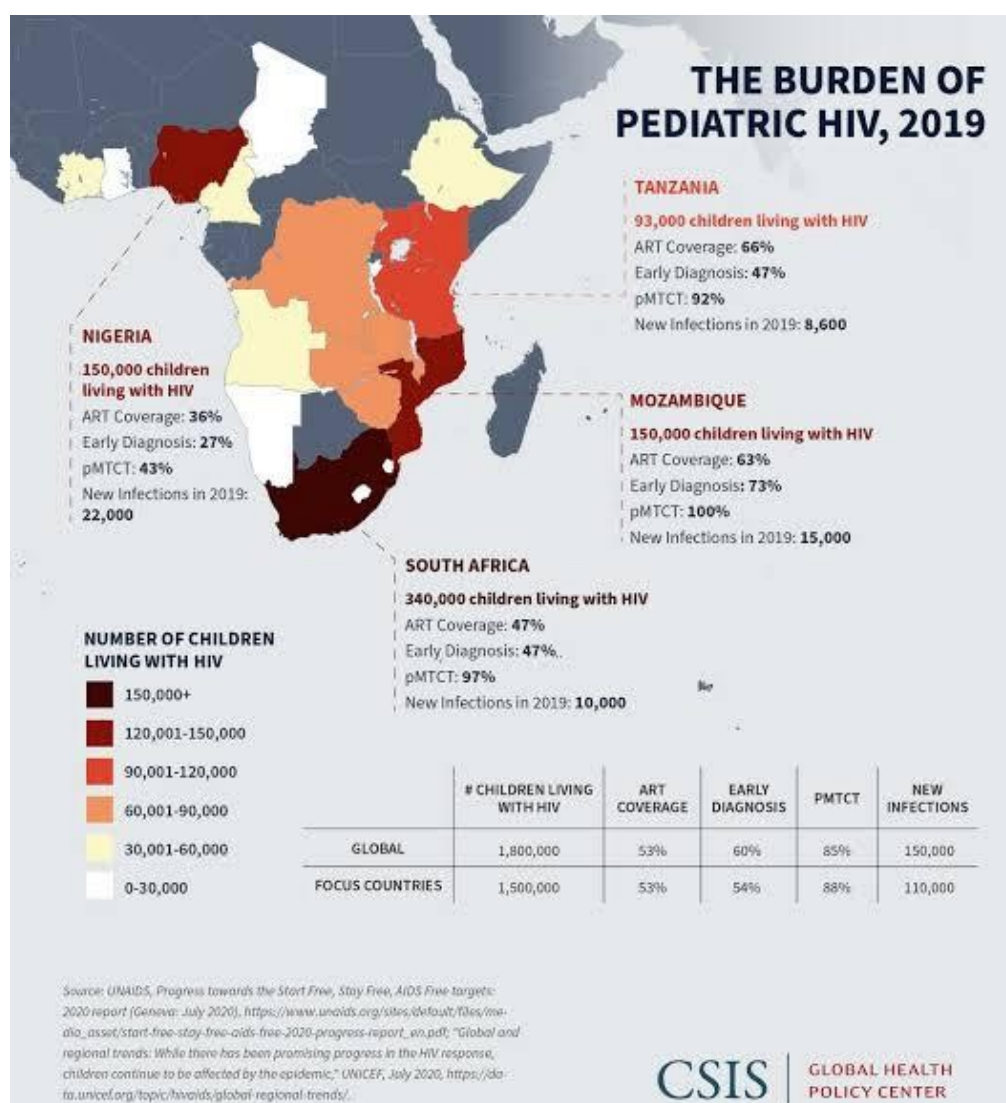
## HIV in Pediatrics: A major Contributor of Morbidity and Mortality in SSA

The HIV pandemic is increasingly affecting the pediatric population. Of the estimated 38.4 million people living with HIV globally in 2021, 2.73 million were children aged 0–19<sup>4</sup>. In a study done by Chloe et al., the estimated HIV prevalence was 0.9% (in Eswatini, Lesotho, Namibia, Malawi, Tanzania, Zambia and Zimbabwe). Where, among the children living with HIV, 61% were newly diagnosed and 39% were previously diagnosed with HIV<sup>5</sup>.

As of 2021, approximately 850 children are infected with HIV each day, and approximately 301 children die from AIDS related causes<sup>4</sup>. Tulla et al. report a pediatric prevalence of 9.3%, and among the infected children, 28.6% died in hospital.

Amy et al. show that an estimated 14.8 million children were HIV exposed but uninfected, with exposure being either during pregnancy, delivery, or breastfeeding. Despite the children not being infected, exposure to HIV contributes to higher infant morbidity and mortality as compared to HIV unexposed and uninfected children<sup>7</sup>. This calls for increased HIV prevention interventions and programs among adolescent girls and women.

Therefore, early diagnosis of HIV in children through parent-initiated testing is critical since a higher prevalence of HIV is reported in patients tested through the PITC model<sup>8</sup>.



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## Antiretroviral Therapy

### Nonadherence to ART Greater in SSA?

For HIV drugs to work optimally, high levels of adherence to ART, i.e. more than 95%, are essential<sup>9</sup>. However, research indicates that incidences of nonadherence are quite remarkable in Africa. A Ugandan study found that only 90% of adolescents had greater than 95% adherence<sup>10</sup>. A similar study conducted in Nigeria reports adherence rates of 92.6% among adults living with HIV who are on ART<sup>11</sup>. A multi-centre study comparing adherence in SSA and Asia reports nonadherence rates of 6.4% in SSA and 4.8% in Asia, within the first 24 months of ART initiation<sup>12</sup>.

Patient-reported barriers to adherence include stigma, side-effects of drugs, forgetfulness, lack of assistance, and travelling<sup>13</sup>. The impact of religious beliefs on adherence remains largely underexplored in the literature<sup>14</sup>.

Facilitators of adherence include social support, reminders, feeling better after taking HIV medications, disclosing one's sero-status, and having a good relationship with the provider<sup>15</sup>. Stigma reflects difficult relations between people living with HIV and their HIV-negative peers and adults. Most interventions target only those with HIV, suggesting a policy shift towards the wider community could be beneficial<sup>13</sup>.

### Resilience in ARV Distribution During the COVID-19 Era

A study done in Kenya's Kibera slum noted a 56% reduction in the uptake of HIV services. 11% of the individuals did not access health facilities for fear of contracting COVID-19<sup>18</sup>. Lockdowns enforced in several countries in the world left PLWHA unable to access their treatment. Moreover, those allowed visits to the clinic to collect their medication were put at risk of contracting COVID-19.

Several strategies were thus put in place to combat the risk to PLWHA brought about by the COVID-19 pandemic. For instance, PEPFAR worked with various MoH in the 21 PEPFAR-supported countries to scale up MMD<sup>16</sup>. In countries like Zambia, under the guidance of MoH, there was implementation of an extension of antiretroviral therapy refill duration to 6 MMD, as well as mobilization of early ART refills by those in HIV care<sup>19</sup>.

Moreover, governments in various countries such as Uganda, after easing restrictions due to COVID-19, ensured continued HIV care and services by implementing services to return viral load testing to normal<sup>17</sup>. Restoration of viral load testing in a bid to note clinical deterioration was combined with ART distribution, where the country relied on volunteers in the network of PLWHA to directly deliver ARVs to communities. These measures have been a great help in managing the treatment of PLWHA post-COVID.

### HIV Drug Resistance in Most LMICs is Above WHO's 10% Threshold

Over the past ten years, ART has expanded at an unparalleled rate; by the end of June 2020, 26 million people were getting ART globally. However, ART effectiveness may be compromised by the emergence of HIV drug resistance<sup>20</sup>. Drug resistance may be primary or acquired: it may have been developed after exposure to ART medications (acquired), or it may have been transmitted during infection (primary)<sup>21</sup>.

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The 2019 WHO global report on HIV drug resistance revealed a prevalence of 10% in pre-treatment HIV medication resistance to NNRTIS among people starting or restarting first-line ART in most LMICs<sup>22</sup>. However, in a cross-sectional study done on ART resistance among adults initiating ART in Uganda in 2016, the overall HIVDR and NNRTI prevalence rates were 18% and 14%, respectively. This was above the WHO threshold of 10%<sup>23</sup>. In most SSA countries, more than 50% of treatment-naïve infants newly diagnosed with HIV carry a virus that is resistant to NNRTIs and more than 10% of them are resistant to NRTIs<sup>22</sup>.

ARVs risk becoming ineffective if HIV drug resistance is not addressed<sup>22</sup>. The rising prevalence of HIV drug resistance to commonly prescribed ART drugs threatens the HIV response and could lead to an increase in HIV incidence, mortality, and treatment costs<sup>24</sup>.

## HIV Testing

### HIV Self-Testing in SSA: Acceptability, Implications and Gaps

Several HIV testing models have been rolled out in SSA to improve access to HIV testing services. Among these models is HIV self-testing, which involves collecting one's own specimen (blood or oral fluid) and then using a rapid HIV test kit to test one's HIV status. Oral HIV self-testing is a high-impact innovative means of increasing HIV case identification<sup>25</sup>. It is a method that provides confidential testing environments<sup>26</sup>. Therefore, barriers to HIV testing such as discrimination, stigma, and lack of privacy can be overcome.

A scoping study targeting SSA revealed a variable acceptability rate of 22.3% to 94% of HIV self-testing, with men having a higher acceptability rate compared to women<sup>26</sup>. The uptake of these services is poor and research around HIV self-testing in SSA is still in its infancy stages. Strategies such as the HIV self-testing Africa (STAR) initiative (2015) have been helpful in scaling up HIV self-testing services in Africa<sup>27</sup>. It includes critical investments in research, implementation, market forecasting, and engagement with stakeholders.

It is important to note that HIV self-testing results are usually reliable for long-standing infections and may not detect recent infections. Therefore, just like with any other screening test a positive result must be confirmed with two follow-up tests. There are situations in which, self-tests may not be accurate, and these include recent HIV infection, people diagnosed with HIV who are on ART, people taking PrEP or PEP, and when the test instructions have not been correctly followed.

Factors that facilitate HIV self-testing uptake include privacy, self-empowerment, convenience, and ease of use<sup>28</sup>. The barriers include the high cost of kits, low literacy levels, and fear and anxiety of positive results<sup>28</sup>. Users also demonstrated a preference for oral-fluid testing due to its less invasive nature compared to the whole blood-based method<sup>30</sup>. HIV self-testing could revolutionize testing in Africa and in order to ensure its uptake, innovative and user-friendly approaches should be adopted<sup>29</sup>.



### HIV Testing in Gestational Women Seems Capricious

38 million people are HIV/AIDS-positive globally<sup>4</sup>. Of these, 1.8 million are children under 15, and 17 million are women<sup>30</sup>. 90% of infant HIV infections are via MTCT<sup>30,31</sup>. The predominant risk factors for MTCT are pregnancy, delivery, and breastfeeding, but infection rates vary<sup>32</sup>. Research shows that more than half of MTCT occurs in the latter weeks of pregnancy, or during labor and delivery<sup>33</sup>. PMTCT interventions reduce MTCT rates<sup>34</sup>. These interventions include HIV testing, enrolling in treatment early in pregnancy, managing births, advising on breastfeeding, and caring for children.

Studies show that pregnant women's knowledge of MTCT, age, stigma, and present living arrangements are predictors of their intention to get tested; younger women are more likely to be tested<sup>35–37</sup>. This may be due to the fact that younger women are more likely to have access to information and expertise about MTCT, have a better understanding of the benefits of HIV testing, and are more capable of making sound choices about whether or not to go for HIV testing<sup>38</sup>. Women who live with their extended family have a higher intention of being tested for HIV than women who live in nuclear families. It is possible that this is because of the impact of grandmothers, aunts, and other female relatives on their female offspring. Many pregnant women, according to some studies, refuse to be tested for HIV because of the stigma associated with the disease. Many women feared being abandoned by their boyfriends if HIV testing revealed a positive result<sup>35</sup>.

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