

## Strengthening the HIV cascade to ensure an effective future ART response in sub-Saharan Africa

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Timely linkage to antiretroviral therapy (ART) care is critical for reducing HIV-related morbidity, mortality and transmission. Studies investigating interventions to improve linkage to, and retention in, pre-ART care in sub-Saharan Africa were reviewed. Certain interventions used to overcome economic barriers for ART-patients (i.e. integration of services, medical and food incentives, intensified counselling and peer support) have also shown favourable results in the pre-ART period. A combined package of interventions found to be effective in the pre-ART and ART period might be effective for reducing attrition in both periods. Further operational research in this area is needed to identify local solutions.

**Keywords:** ART, Attrition, HIV, Loss to follow-up, Pre-ART, Retention

Sub-Saharan Africa is home to the largest HIV cohorts in the world, with antiretroviral therapy (ART) programmes now nearly a decade old, serving over 30 000 HIV-infected individuals.<sup>1,2</sup> As ART services have been brought to scale several programmatic challenges have emerged, including suboptimal rates of HIV testing, ART adherence and retention in ART care.<sup>3,4</sup> Currently, HIV programmes are faced with an additional challenge of delayed linkage to HIV and ART care and high pre-ART attrition among HIV-infected individuals, which is hindering further scale-up of these programmes and attainment of universal coverage.<sup>5–7</sup>

Timely linkage to ART care is critical for reducing HIV-related morbidity and mortality. In addition, there is increasing interest in treating people earlier in their disease progression as a way to reduce HIV transmission. This strategy of ‘treatment as prevention’ is primarily aimed at increasing the proportion of patients on ART who are virologically suppressed and at a negligible risk of transmitting the virus on to others.<sup>8</sup> The success of this strategy hinges on the ability to treat HIV-infected individuals before their HIV-RNA viral loads increase, ensure timely linkage to ART care, and maintain patients on effective lifelong treatment.<sup>9,10</sup> However, ART-eligible individuals often present late to clinical services and despite the expanding ART-eligibility threshold from <200 to <350 cells/ $\mu$ l (and when the 2013 WHO guidelines are implemented, to <500 cells/ $\mu$ l),<sup>11</sup> the median CD4 count at ART initiation remains low (81–120 cells/ $\mu$ l),<sup>12</sup> with one in four

individuals starting ART with a CD4 count <100 cells/ $\mu$ l.<sup>11</sup> Thus, currently most individuals in sub-Saharan Africa are commencing ART after a period of sustained high viral load. While much of the focus on treatment as prevention has been on earlier ART initiation, the success of this approach in reducing HIV transmission is also dependent on long-term retention in care, yet retention in care has been estimated to be 60% at 2 years, after treatment initiation, in ART programmes in sub-Saharan Africa,<sup>5</sup> with long-term retention of only 38% at 7 years in an urban clinic in South Africa.<sup>13</sup>

Three systematic reviews have documented the high attrition occurring in the period between HIV diagnosis and ART initiation.<sup>5–7</sup> Similarities in the barriers to linkage to, and retention in, care exist for both ART-ineligible and -eligible individuals. Getting to the clinic and ensuring regular clinic attendance is a common problem encountered by both groups of individuals as it is challenged by high transport costs, long distances and other competing priorities.<sup>14</sup> Certain interventions used to overcome these economic barriers for patients on ART (i.e. integration of care,<sup>15,16</sup> treatment supporters,<sup>17</sup> nutrition support<sup>18–20</sup>) have also been evaluated for the pre-ART care period and have shown favourable results. Integration of health services reduces the number of trips an HIV-infected individual has to make to the clinic. A study conducted in Zambia which integrated ART and antenatal-care found a twofold-increase in the risk of enrolling in HIV care and ART initiation.<sup>21</sup> Similarly, increase in linkage

to ART care was also observed in a study conducted in Cambodia, in which the impact of an improved referral, communication and teaching intervention among co-infected TB patients was assessed.<sup>22</sup> Intensified post-test counselling and enhanced peer-support in Uganda was also found to increase the proportion of HIV-infected individuals enrolling into pre-ART care, following diagnosis, by 29%.<sup>23</sup> In addition, two studies from Kenya have shown that regular home visits by a patient navigator increases linkage to HIV care,<sup>24</sup> and provision of cotrimoxazole to encourage regular pre-ART clinic attendance doubled pre-ART retention.<sup>25</sup> Of note, food incentives increased regular attendance in children<sup>26</sup> and decreased time to ART initiation among drug users in India,<sup>27</sup> although these interventions have yet to be assessed in sub-Saharan Africa. Interventions to overcome the main health system barriers such as an efficient appointment and patient-monitoring system, providing after-hours and weekend clinics need further investigation, as this could potentially overcome obstacles faced by both ART-ineligible and -eligible individuals.

Strengthening the existing HIV cascade through improving linkage to, and retention in, pre-ART and ART care is, therefore, critical to ensuring successful future ART scale-up and to maximise the benefits of long-term ART, including reduced HIV transmission. Integration of services, enhanced counselling, peer support and referral as well as medical and food incentives have been found to be effective in improving both linkage to, and retention in, pre-ART and ART care. These interventions could be implemented simultaneously to target both periods of care, although 'one size' is unlikely to 'fit all' and a combined package of interventions might be more effective. Further operational research in this area is urgently needed in order to identify local solutions that work to support the future effectiveness of the ART response.

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