Closing the HIV Prevention Gap: Scaling ART & PrEP to Reduce Global Incidence by 1 Million/Year

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PLAIN LANGUAGE SUMMARY

To cut new HIV infections by 1 million yearly, we need 10 million more people with HIV on effective treatment (U=U) or 100 million on prevention (PrEP)—or a mix of both. We reached less than 4 million of the 21 million UNAIDS PrEP target, and current plans for 2 million people using lenacapavir long-acting PrEP would stop only 20,000-50,000 of more than 1 million infections every year. Since nearly half of new infections occur in people not typically targeted for PrEP programs, we need multiple long-acting PrEP options so that people can choose what works for them, and ultimately a vaccine to stop the pandemic.

BACKGROUND Global HIV incidence remains high, with ~1.3 million new acquisitions in 2024. Of 40.8 million PLWH, an estimated 11 million (27%) had detectable HIV RNA. Among the 11 million PLWH with detectable RNA, 48% (5.3 million) were unaware of their status, 35% (3.9 million) were aware but not on ART, and 16% (1.8 million) were on ART but not suppressed. UNAIDS data from 2018–2024 show a stable ratio of ~1 HIV acquisition per 10 viremic PLWH.

METHODS We modeled ART, PrEP, and mixed scale-up scenarios needed to avert 1 million HIV acquisitions annually—the reduction required to reach the UNAIDS goal of ≤200,000 by 2030. Using UNAIDS data, we analyzed parallel declines in viremic PLWH and incidence, applying a simple ratio framework (1 acquisition per 10 viremic PLWH per year). We then modeled expanded PrEP coverage, assuming a conservative global number needed to treat (NNT) of 100 (PURPOSE 1 and 2 trials NNT = 41 and 42).

RESULTS 10 million additional PLWH achieving viral suppression through ART would prevent ~1 million HIV acquisitions annually. Alternatively, ~100 million people on effective PrEP would be needed. A mix is likely most realistic, for example, 5 million additional PLWH achieving suppression plus 50 million PrEP users could jointly avert ~1 million acquisitions annually. Current PrEP use globally remains far below this threshold: UNAIDS estimates 3.9 million oral PrEP users in 2024, far short of the 2025 target of 21.2 million. Declines in HIV incidence to date have been primarily driven by ART expansion (U=U), which grew from 7.7 million on ART in 2010 to 31.6 million in 2024, but still falls short of the 34 million target for 2025.

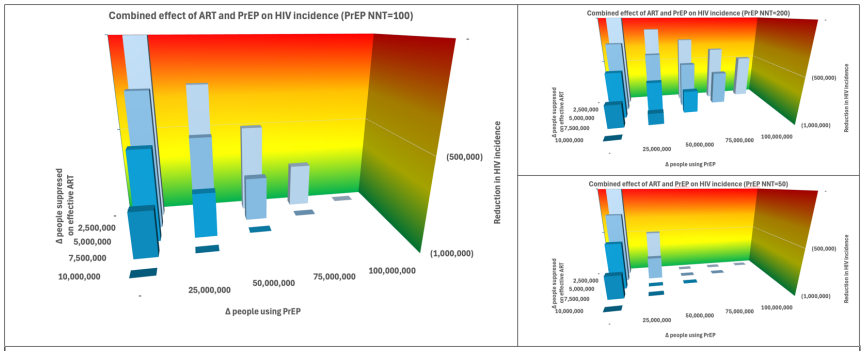
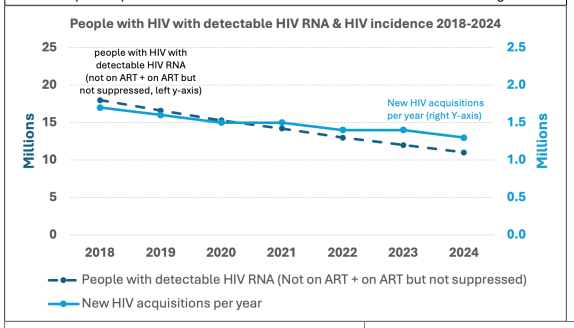


Figure 1 (above). 3D plot to show the effects of Δ people suppressed on effective ART (U=U) and Δ people using PrEP on reduction in HIV incidence with PrEP NNT=100 (left), NNT=200 (top right), NNT=50 (bottom right). NNT in the PURPOSE 1 and 2 trials was 41 and 42.

Figure 2 (below). People with HIV with detectable HIV RNA & HIV incidence over time. The ratio of 1 HIV acquisition per ~10 viremic PLWH is consistent over time and most UNAIDS regions



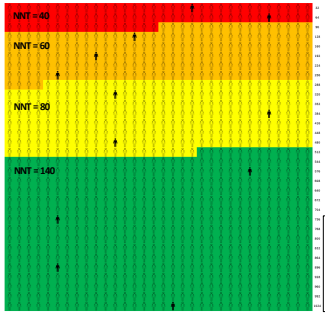
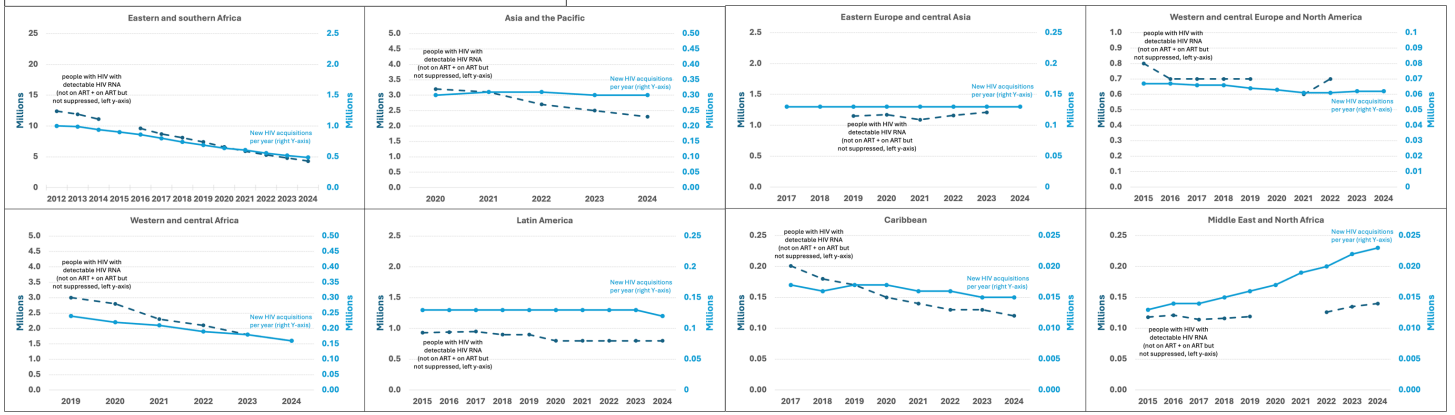


Figure 3 (to the left). The Number Needed to Treat (NNT) determines how many people need to use PrEP to prevent 1 HIV acquisition. HIV acquisitions are not evenly distributed across populations. In this example, the overall NNT is 87, and 50% of acquisitions occur in the 'general' population (NNT=140) who are not usually targeted for PrEP and are unlikely to consider themselves at risk. Figure based on Rosenberg et al CID 2024 (PMID: 38657086) and Beyrer et al Lancet HIV 2024 (PMID: 38925732).



CONCLUSIONS The massive roll-out of ART around the world has led to reductions in HIV incidence. But we are not on track to meet our goals. Achieving an additional 1 million annual reduction in HIV acquisitions will require expanded ART coverage (10 million more virally suppressed) and PrEP scale up (to ~100 million users), or a combination of both. The persistent ratio of 1 acquisition per 10 viremic PLWH, consistent across UNAIDS regions, highlights that ART roll-out (U=U) has driven declines to date, but closing the prevention gap will require integrating U=U with large-scale PrEP expansion. These findings underscore that the recently announced Global Fund and PEPFAR target of 2 million people on lenacapavir by 2028 is a step forward, but at the same time insufficient (20,000-50,000 infections averted annually–NNT range 40-100) relative to the scale needed. We need even more ambitious targets for long-acting PrEP to achieve epidemic control by the 2030s. Since nearly half of new infections occur in people not targeted for prevention programs, we need multiple long-acting prevention options so that people can choose what works for them, and ultimately a vaccine to stop the pandemic.

ADDITIONAL KEY INFORMATION

UNAIDS data www.unaids.org/en/resources/fact-sheet