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Threading the needle: how to maximize the impact of new strategies to prevent mother-to-child HIV transmission without harming existing services

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Over the past decade, global efforts to prevent mother-to-child HIV transmission (PMTCT) have been driven by rapid progress in scientific discovery, policy, and program implementation. At the forefront of these advances has been the “Option B+” strategy to provide lifelong antiretroviral therapy (ART) to all HIV-infected women identified during pregnancy or breastfeeding. Initially developed as a strategy for settings in which CD4⁺ T-lymphocyte testing was not available, Option B+ is now endorsed by the World Health Organization and is being adopted widely. While there are many clinical and operational justifications for the strategy, successful implementation of Option B+ requires substantial new investments in health infrastructure. Concerns that introduction of ambitious new services may siphon already scarce resources away from other initiatives are legitimate and warrant a careful evaluation and policy response.¹

Since Option B+ implementation is in its relatively infancy, there are presently very few data describing its impact on health systems. Work surrounding general HIV treatment expansion in Africa, however, may provide important insights. Several studies have investigated whether additional resources devoted to ART scale-up have adversely affected the delivery of other health services – a phenomenon known as “crowding out” in the economics literature – or whether they have instead bolstered health systems. At the facility level, the impact of such HIV programs have been mixed. In Zambia, for example, integration of ART services into the general outpatient department in two clinics was associated with significant increases in patient-provider contact time for non-HIV patients, but decreased contact for those requiring HIV care.² In Tanzania, a program to integrate HIV testing into childhood immunization programs demonstrated a modest increase in vaccine uptake within four urban facilities, but a consistent decrease along similar indicators in four rural sites.³

Others have taken a broader approach, estimating associations between national health indicators and HIV service scale-up. Using publicly available data from the World Health Organization Statistical Information System, Duber and colleagues reported no differences in key indicators between focus and non-focus countries for the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) from 2000 to 2006.⁴ Three later studies – each with longer post-ART program follow-up – provide at least some support for the “positive spillover”

argument. Bendavid, *et al.* found a larger decline in adult all-cause mortality in PEPFAR focus relative to non-focus countries; the point estimates for the effect on HIV-specific mortality was smaller, suggesting that positive spillovers could have occurred.⁵ Rasschaert, *et al.* demonstrated reduced morbidity and mortality in Malawi (2004-2009) and Ethiopia (2005-2009) following the expansion of their respective national HIV treatment programs.⁶ Grépin highlighted the complexities of these relationships when studying the impact of donor HIV funding on other health service delivery. From 2003 to 2010, she demonstrated a negative impact of HIV funding on childhood immunizations in sub-Saharan Africa, but spillover benefits in some maternal health services.⁷ While encouraging, it is important to note that these ecological studies have important limitations, especially in attributing causality.

What will happen in the context of Option B+ implementation? While net negative consequences are certainly possible, the existing literature suggests the potential for broad positive impact as well. The likely influences on existing health services can be categorized as the result of either supply- or demand-side factors. Supply-side factors include aspects of health infrastructure: human resources, commodity security, physical clinic space, and medical training. Investments made by national governments and donor agencies to meet these needs can have important spillover benefits for the non-pregnant HIV-infected individuals, particularly in remote and rural sites where pre-existing ART access and health infrastructure may be limited. Alternatively, if resources required for Option B+ are redirected at the local or national level from other clinical services, then the supply-side effects of B+ may be negative, with adverse impacts within the health sector. Demand-side factors may also play a key role in determining the effect of Option B+ on broader health outcomes. By liberalizing eligibility criteria for lifelong treatment, Option B+ directly generates greater demand for ART among HIV-infected pregnant women and perhaps more generally for antenatal care services. Such a strategy may also indirectly increase demand for HIV testing and entry of non-pregnant HIV-infected adults into care through various mechanisms, including increased partner testing, reduced stigma and discrimination, intensified community education about HIV, and enhanced family-based care. Together, these influences could ultimately serve to reduce new HIV infections and improve population health.

We advocate several broad approaches to maximize the impact of Option B+ while mitigating the risks to other health services. First, as policymakers plan to implement Option B+, there must be an emphasis on appropriate resourcing and realistic program targets. While enthusiasm for this bold PMTCT approach has reinvigorated global efforts to dramatically reduce pediatric HIV, a balanced implementation strategy that carefully manages the above-mentioned supply- and demand-side factors is critical to sustained success. Second, dedicated resources should be leveraged to further strengthen health systems integration. With Option B+, services for ART and PMTCT are more closely aligned than ever and this should be reflected in the types of structural investments made to support both. Similarly, Option B+ implementation necessitates more integrated care approaches between HIV and maternal-child health, further bridging clinical services that have traditionally been viewed as separate in many settings. Third, continuous quality

improvement should be emphasized as part of Option B+ implementation, with key program indicators collected for HIV and non-HIV health services. The monitoring of these facility-based indicators over time can serve as an early warning system for bottlenecks within the health sector. The development of human resource capacity capable of addressing such challenges can also lead to more efficient performance overall.

Finally, we urge further study in this critical area. Alongside intensive evaluation of pregnant and postpartum HIV-infected women initiating ART, we encourage broader evaluations designed to determine the impact on health service delivery and population health. Most ongoing monitoring activities can only track longitudinal trends in ART uptake at the facility level. Repeated implementation of community-based assessments such as household surveys are needed to describe the penetration of services within populations and to assess what happens to various health outcomes. Addition of targeted questions and biological testing (e.g., HIV testing, CD4⁺ T-lymphocyte screening, viral load monitoring) to standard AIDS Indicators Surveys – as was introduced in Kenya in 2012 – could provide better indicators of program coverage and success at the population level. Focused, but more frequent, surveys would help to monitor trends over time, while offering actionable data to program managers about attrition at each step of the treatment cascade. Structured within rigorous evaluation designs, such surveys could also be used to understand impacts on other health services and health outcomes: from utilization of antenatal services, child immunizations, and general outpatient care to population-level morbidity and mortality. As local governments and donors seek to determine the costs and benefits of Option B+, an assessment of such indirect effects is essential for comprehensively valuing such ambitious initiatives and addressing their unintended consequences.

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