Costs of eliminating HIV in South Africa have been underestimated

In 2009, Reuben Granich and colleagues reported, on the basis of a modelling study,1 that HIV could be eliminated in South Africa by use of a universal “test and treat” strategy. The strategy involved annual testing of all 32 million adults; immediate antiretroviral therapy for those who test positive, irrespective of their CD4+ cell count or stage of infection; and a package of prevention interventions (male circumcision, behaviour change programmes, condom promotion, and treatment of curable sexually transmitted infections) extensive enough to cause a 40% reduction in incidence (the proportion stated as necessary for elimination by WHO). The utility, feasibility, and potential effectiveness of this strategy have been extensively discussed.2–5 However, little attention has been paid to Granich and colleagues’ estimates of the cost of the proposed strategy, and whether these estimates include all costs or just the cost of treatment.

The number of adults that would be on treatment in South Africa if this proposed strategy is enacted is shown in figure A. Notably, 6 years after the strategy is implemented, about 4·3 million adults would be on treatment. Additionally, about 2·3 million individuals in South Africa would be on treatment when the WHO elimination threshold (ie, one new HIV infection per 1000 adults) is reached. Clearly, the strategy would be extremely costly in terms of treatment alone, but it would also require substantial financial resources to pay for the extensive prevention interventions, as well as for annual testing. Most importantly, a huge and immediate financial investment would be necessary to scale up the health-care infrastructure by about ten-fold to treat and monitor more than 4 million adults every year (currently 500 000 are treated annually).

To determine what costs Granich and colleagues included in their cost curve, we constructed a curve based only on treatment costs. We used Granich and colleagues’ assumption that the maximum cost of treating a patient with first-line drugs is US$1163 per year and with second-line drugs is $4083 per year, and that, every year, 97% of patients would need first-line drugs and 3% would need second-line drugs. For the first 5 years after implementation of the strategy, the cost curve we generated and that published by Granich and colleagues are in complete agreement (figure B). After year 5, Granich and colleagues included a relatively small additional cost each year, on top of the treatment costs.

Our calculations therefore suggest that Granich and colleagues’ cost curves are based only on treatment. Consequently, we believe that the costs of a universal test and treat strategy for eliminating HIV in South Africa have been substantially underestimated.

We declare that we have no conflicts of interest.

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Towards better science and programmes

I admire greatly The Lancet’s engagement in cutting-edge global health issues. Yet I believe you need more care with certain types of analytical articles, and should solicit accompanying Comments that provide better scientific critique. Here I discuss four Articles with major flaws and their respective Comments in my area of interest—HIV and reproductive health. Although space constraints preclude a full description of these weaknesses, I can provide a taste.

Article A\(^1\) proposed a mathematical model of generalised HIV epidemics, but it virtually omitted multiple sexual partnering, which by definition underlies any heterosexual epidemic. The accompanying Comment\(^2\) failed to address this fundamental flaw (although it did mention some other weaknesses).

Article B\(^3\) advanced a deterministic model of generalised epidemics as a basis for advancing use of antiretroviral drugs as prevention. But that model has been roundly criticised.\(^4\) Among its weaknesses are that it modelled only a single-sex epidemic; it did not distinguish the crucial differences in infectiousness across the various stages of HIV disease, and it failed to address drug resistance or risk compensation. Article B actually had two Comments. One, unusually, was by one of the coauthors of the paper itself.\(^5\) The second overlooked the major modelling flaws, stating that “the model findings appear robust and the critical mathematics is straightforward.”\(^6\)

Articles C\(^7\) and D\(^8\) attempted to assess associations between intimate-partner violence and fetal loss and HIV, respectively, within observational datasets amid extremely complicated inter-relationships and potential confounding. Although they both asserted causality, neither successfully ruled out other explanations. Also Article C’s endpoints had extremely weak temporal plausibility and the paper failed to address the alternative explanation of under-reporting of induced abortion. Article D did not address male partner’s multiple partnering as a common risk factor for both HIV and intimate-partner violence. It also did not disclose that the primary intervention study, from which the data were derived, actually conflicted with the Article’s main finding. It reduced intimate-partner violence but not HIV. Neither of the respective Comments on C\(^7\) and D\(^8\) addressed these weaknesses, but essentially accepted them at face value and opined on the ramifications. Finally, a Lancet Editorial accepted Article D uncritically.\(^9\)

I realise that scientific journals are subject to the limitations of the peer-review process. But these two particular types of analysis—modelling of complex processes, and multivariate analyses of complex relations in observational datasets—bear additional scrutiny. Both have general inherent pitfalls and limitations. I also urge a different approach to Comments about key Articles to foster a more balanced, critical approach, as is often seen in other journals. Along with a laudable zeal to advance global health, comes an obligation for quality, lest programme efforts be diverted by well intentioned but misguided conclusions.

I declare that I have no conflicts of interest.

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Misoprostol use in the community to reduce maternal death

The Comment by Malcolm Potts and colleagues (May 22, p 1762)\(^1\) accompanying the paper by Mariana Widmer and colleagues\(^2\) contains several mis-statements.

Widmer and colleagues’ study answers the question: does misoprostol added to standard recommended treatment for post-partum haemorrhage (PPH) improve maternal outcomes in hospital settings where oxytocin is readily available? It compared women diagnosed with PPH who were given recommended treatment (plus placebo) with women given standard treatment plus misoprostol. Blood loss was not

3 Wagner BG, Kahn JS, Blower S. Should we try to eliminate HIV epidemics by using a ‘test and treat’ strategy? AIDS 2010; 24: 775–76.
4 Diefenbach CW, Fauci AS. Universal voluntary testing and treatment for prevention of HIV transmission. JAMA 2009; 301: 2380–82.