industrial and developing countries with the shared goal of ending the HIV/AIDS pandemic.

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Combination HIV prevention and the battle of the sexes

1.6 million new HIV infections occur every year in sub-Saharan Africa. Transmission is predominantly heterosexual, and women (by comparison with men) are disproportionately infected. The international agencies that propose policy guidelines for control of the HIV pandemic, such as WHO and the Joint UN Programme on HIV and AIDS, have recognised the crucial need to reduce the number of new infections in women and girls and mother-to-child transmission of HIV.

No intervention is 100% effective at protecting against HIV infection. As a result, a combination of different types of interventions—ie, use of a combination HIV prevention (CHP) approach—is necessary to prevent the maximum number of new infections. Mathematical models that specify the transmission dynamics of HIV have been used to identify which combination of interventions would be the most cost effective at reducing transmission. In these studies, several different combinations of interventions are compared. The transmission models are used to predict the number of HIV infections that would be prevented by each combination. The cost-effectiveness of each combination is then calculated by dividing the predicted number of prevented infections by the cost of the interventions.

Cost-effectiveness analyses should be used as the foundation for allocation of HIV-prevention budgets. However, these analyses do not always identify the best CHP approach for the control of generalised epidemics in sub-Saharan Africa because the most cost-effective approach—as shown by Anderson and colleagues—is to spend most of the prevention budget on men. Men will always win in the battle of the sexes in terms of resources for HIV prevention—the reasons for which are two-fold. First, the most cost-effective intervention is medical male circumcision, which reduces a man’s risk of infection by about 60%. Unfortunately, no similar cost-effective intervention exists for women. The second reason is more complex,
but is based on the following points: the most effective intervention is to use treatment as prevention (TasP) because treatment makes infected individuals about 96% less infectious. TasP is an indirect prevention method (ie, treating one sex indirectly protects the other sex), and more infections are prevented by treating a man than by treating a woman. As a result, cost-effectiveness analyses will always lead to the following recommendations: use male circumcision to provide direct protection to men (voluntary medical male circumcision programmes are now being rolled out in many sub-Saharan African countries), spend little to no resources on interventions that directly protect women (eg, microbicides), and use TasP but preferentially allocate treatment to men.

The figure illustrates the effect of preferentially allocating treatment, based on sex, on the cost-effectiveness of TasP. Colours show the change (as a percentage) in the cost-effectiveness of a preferential allocation strategy by comparison with one that allocates resources equally between women and men. Studies suggest that the per-act risk of acquiring HIV infection is greater for women than for men, and that the risk can be almost double. The more male-biased the allocation strategy, the more cost effective the intervention. Notably, preferentially allocating resources to women is always less cost effective than the sex-equitable allocation strategy. Additionally, the greater the risk for women by comparison with men, the more beneficial the effect of prioritising men and the more detrimental the effect of prioritising women.

We recommend that any cost-effectiveness analysis of the CHP approach should be extended to allow sex-equity and ethics, as well as other criteria, to be factored into the analysis; likewise, the effect of interventions on the reduction of mother-to-child transmission needs to be considered.

Medical male circumcision and TasP are cost-effective interventions that should be used. However, to provide direct protection to men, but only indirect protection to women, would be unethical. Furthermore, to preferentially allocate treatment and its survival benefit to men would also be unethical. A CHP approach is the way to end the HIV pandemic, but it should not lead to a battle of the sexes.

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Figure: Percentage change in cost-effectiveness when preferentially allocating resources for TasP by sex. The y-axis shows the percentage of the budget for TasP-based interventions that is allocated to men; if it is 100% then the entire budget is spent on men, if it is 0% the entire budget is spent on women. The black horizontal line shows the sex-equitable strategy; using this strategy 50% of the budget is spent on men and 50% is spent on women. The x-axis shows the relative per-act transmission probability (defined as the probability of an infected man transmitting HIV to a susceptible woman divided by the probability of an infected woman transmitting HIV to a susceptible man); a number greater than one signifies that the per-act risk of infection for a woman is greater than that for a man. TasP-treatment as prevention.


Corrections

Church JA, Fitzgerald F, Walker AS, Gubb DM, Prendergast AJ. The expanding role of co-trimoxazole in developing countries. Lancet Infect Dis 2014; published online Nov 14. http://dx.doi.org/10.1016/S1473-3099(14)71011-4—This Review has been republished with a new DOI, http://dx.doi.org/10.1016/S1473-3099(14)71011-4. This does not change the original online publication date of Nov 14. The online version has been corrected as of Jan 22, 2015.

Tully CM, Lambe T, Giltbert SC, Hill AVS. Emergency Ebola response: a new approach to the rapid design and development of vaccines against emerging diseases. Lancet Infect Dis 2015; published online Jan 14. http://dx.doi.org/10.1016/S1473-3099(14)70711-0—The acknowledgments section should have included the Wellcome Trust, Department for International Development, Medical Research Council, and National Institute for Health Research. This correction has been made to the online version as of Jan 20, 2015.

Schlagenhaup P, Weld L, Goorhuis A, et al. Travel-associated infection presenting in Europe (2008–12): an analysis of EuroTravNet longitudinal, surveillance data, and evaluation of the effect of the pre-travel consultation. Lancet Infect Dis 2015; 15: 55–64—The author list should have included Christope Rapp (Department of Infectious and Tropical Diseases, Begin Military Hospital, Saint-Mandé, France) at position 21. CR declares no competing interests. This corrections have been made to the online version as of Feb 23, 2015.

Zingg W, Holmes A, Duttonkerfer M, et al. Hospital organisation, management, and structure for prevention of health-care-associated infection: a systematic review and expert consensus. Lancet Infect Dis 2015; 15: 212–24—The Acknowledgments of named people to the project should have read “We thank Marc Struelens who initiated this systematic review. We thank Yehuda Carmeli, Ewan Ferle, Petra Gastmeier, Waleria Hryniewicz, Smita Kalenic, Claire Kilpatrick, Nina Sorknes, Emese Szilagyi, Rososlla Vatcheva-Dreborska, and Charles Vincent for their contribution as experts. We also thank Anna Dittrich, Winfried Ebner, and Rachel Edwards for assistance in the process of the systematic review, Rosemary Sudan for editorial assistance, and Fabrizio Da Liberdade Jantarada for administrative support during the project.” This correction has been made to the online version as of Feb 23, 2015.

Izuelia HS, Thadami N, Shuy DK, et al. Comparative effectiveness of high-dose versus standard-dose influenza vaccines in US residents aged 65 years and older from 2012 to 2013 using Medicare data: a retrospective cohort analysis. Lancet Infect Dis 2015; 15: 293–300—in the third sentence of the Findings section in the Summary of this Article (published Online First on Feb 9, 2015), ”high-dose vaccine (1.30 outcomes per 10,000 person-weeks)” should read “high-dose vaccine (1.01 outcomes per 10,000 person-weeks)” and “standard-dose vaccine (1.01 outcomes per 10,000 person-weeks)” should read “standard-dose vaccine (1.30 outcomes per 10,000 person-weeks).” These corrections have been made to the online version as of Feb 23, and the printed Article is correct.