Women are now becoming pivotal in the epidemiological spread of HIV infection throughout the world, especially in developing countries, where heterosexual transmission accounts for more than 80% of all new HIV infections. Recently, significant but partial successes have occurred in the field of HIV prevention, including male circumcision, preventive HIV vaccines, vaginal microbicides and oral pre-exposure prophylaxis, and there is increasingly widespread access to antiretroviral treatment. However, none of the currently available tools for HIV intervention are sufficiently effective, particularly for women, and all require further development. Among all biomedical approaches, microbicides could hold the greatest hope of curtailing AIDS worldwide, especially if used by women in Africa. Research for an efficacious microbicide constitutes a priority in the global agenda to prevent HIV infection. Finally, the combination of existing partially effective strategies for HIV prevention should be promoted, scaled-up and evaluated.