groups received identical education on condom use and prevention of HIV-1 infection. Further, controls with STD symptoms at enrolment received treatment, and all participants were encouraged to seek care if they had symptoms of STD between the survey rounds. Thus, the control group benefited from intervention activities that would tend to keep the difference between the intervention and control groups to a minimum.

On this background I fully agree with the conclusion given by Hitchcock and Fransen that anything other than a sustained commitment to STD prevention as an important part of HIV-1 control programmes is unthinkable.

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1 Hitchcock P, Fransen L. Preventing HIV infection: lessons from Mwanza and Rakai. *Lancet* 1999; **353:** 513–15.
2 Grosskurth H, Mosha F, Todd J, et al. Impact of improved treatment of sexually transmitted diseases on HIV infection in rural Tanzania: a randomised controlled trial. *Lancet* 1995; **346:** 530–36.
3 Wawer MJ, Sewankambo NK, Serwadda D, et al. Control of sexually transmitted diseases for AIDS prevention in Uganda: a randomised community trial. *Lancet* 1999; **353:** 525–35.

Sir—Penny Hitchcock and Lieve Fransen[1] provide a plausible epidemiological explanation for the strikingly negative results of Maria Wawer and colleagues' STD prevention trial[2] on HIV-1 incidence rates in Rakai Uganda. Nevertheless, Hitchcock and Fransen go on to recommend that STD prevention programmes should be equally implemented in similar contexts with mature HIV-1 epidemics. They are of course right, for Wawer's negative result in a community intervention trial will not withhold us from preventing and treating STDs. We might, however, still want to reflect a bit on the design of such a STD prevention programme.

Our experience in communicable disease control in the Great Lakes area, makes us concerned about the consequences of large-scale distribution of ciprofloxacin in areas where multiresistant shigellosis is endemic.[3] Furthermore, on the basis of data provided by Wawer and co-workers and current generic drug prices, we estimate the drug cost for one course of their intervention regimen to be US$22.50. Applying this drug scheme every 10 months to all participants aged 15–59 years in the Rakai community would thus amount to $5 184 000 for drugs only.

Mass treatment by the project team, with exclusion of prior household census, took reportedly 1 month to complete per cluster (about 1330 people). Extrapolation of this workload to the total Rakai district adult population amounts to 144 months' work, or at least 22 mobile teams to employ simultaneously and full time. The running cost to maintain one mobile team for Uganda's sleeping sickness programme is currently estimated at $3500 per month (M Gastellu-Etchegorry, personal communication), which brings a minimum estimation of the running cost for the STD intervention to about $15 per inhabitant per year. The World Bank estimated that Uganda's total health expenditure per inhabitant was $10 in 1994.[4] Given current health-service budgets in the countries the intervention is supposedly designed for, we were puzzled to read that Hitchcock and Fransen described this intervention as "feasible" and "affordable".

Considering the comprehensive package of quality health-care services that could have been provided to Rakai district for the budget allocated to this study, is it ethical to undertake a community trial if researchers know that its results, whether positive or negative, will not alter current control policies anyway? Moreover, is it ethical to undertake community trials to test interventions that are, from a public-health perspective, unsafe, unfeasible, and unaffordable for that same community? This question was also raised by the Perinatal HIV Intervention Research in Developing Countries Workshop Participants (March 6, p 832).[5] We wonder whether African communities have any power to oppose this kind of epidemiological research.

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1 Hitchcock P, Fransen L. Preventing HIV infection: lessons from Mwanza and Rakai. *Lancet* 1999; **353:** 513–15.
2 Wawer MJ, Sewankambo NK, Serwadda D, et al. Control of sexually transmitted diseases for AIDS prevention in Uganda: a randomized community trial. *Lancet* 1999; **353:** 525–35.
3 Legros D, Ochola D, Lwana N, Guma G. Antibiotic sensitivity of endemic Shigella in Mbarara, Uganda. *East Afr Med J* 1998; **75:** 160–61.
4 The human development network, the World Bank Group. Health, nutrition & population (sector strategy) Washington, DC: The World Bank, 1997.
5 Perinatal HIV Intervention Research in Developing Countries Workshop Participants. Science, ethics, and the future of research into maternal infant transmission of HIV-1. *Lancet* 1999; **353:** 832–35.

*Authors' reply*

Sir—Angus Nicoll and colleagues suggest that the divergent results of the Mwanza and Rakai STD control trials for AIDS prevention were due to the interventions used: syndromic treatment in the former study and mass treatment in the latter. It is unlikely that a syndromic approach would have had substantial effects on HIV-1 in Rakai, where most HIV-1 transmission occurred independently of STD symptoms or laboratory diagnoses. In addition, the sensitivity and specificity of symptoms of STD screening were poor[1] (as has also been reported in Mwanza).[2] Finally, many symptoms in the Rakai population were not due to treatable STDs: 42% of genital ulcers were herpes simplex virus-2, and only 7% were identified as syphilis or chancroid; over 50% of women had bacterial vaginosis, a disease which is not amenable to cure and is associated with risk of HIV-1.[3] The hypothesis that the Mwanza trial achieved success by reducing symptom duration is attractive, but data on duration were not reported in that study. Finally, reintroduction of STDs in Rakai may have diluted an effect; however, in a substudy of pregnant women in whom STDs were significantly reduced in the intervention compared with the control group, we observed no reduction in HIV-1 incidence.

Gunnar Kvåle suggests that the Rakai results may have been due to lack of comparability between groups, or to the services offered to the control population. Absolute differences between groups in the distribution of key variables were small, and were adjusted for in analyses. Condom use was low in both groups, and only 16% of patients with symptoms in the control group reported seeking effective treatment. Thus, ethically mandated services cannot explain the negative results in the overall population or in all subgroups.

Francine Matthys and Marleen Boelaert raise issues of drug resistance and costs. Medications were provided as single, directly observed treatment, to keep inadequate compliance, a main cause of selective resistance, to a minimum. Gonorrhoea sensitivity testing identified no resistant strains. The drug costs estimated by Matthys and Boelaert are excessively high: metronidazole, ciprofloxacin, and penicillin together cost under US$1 in Kampala pharmacies. These drugs are also included in the Uganda Ministry of Health standard drug regimen, where their combined cost is even lower. Azithromycin is being used in mass treatment trachoma campaigns in developing countries, and prices are