Utility and delivery of behavioural interventions to prevent sexually transmitted infections

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INTRODUCTION
Over the past three decades, research focus on the development and evaluation of behavioural interventions aimed at reducing the spread of sexually transmitted infections (STIs) including HIV has expanded considerably. Individual, couple and group level interventions aimed at improving condom use, HIV testing, linkage to care and retention, medication adherence, partner counseling and referral services, and decreasing number of partners have been developed and evaluated for many subpopulations. The interventions have been evaluated among African—Americans, Asian and Pacific Islanders, drug users, heterosexual adults, high-risk youth, Hispanic populations, men who have sex with men, people living with HIV, STI clinic patients, and transgender populations. However, despite their availability, behavioural interventions are inadequately utilised, and evidence of their population level impact is lacking. In this paper we discuss issues related to the utility of behavioural interventions, including questions around feasibility of implementation, scale-up and maintenance, and suggest new directions for planning, implementation, evaluation and continuous improvement of social and behavioural interventions in the context of STI and HIV prevention programmes.

EVALUATION OF EFFICACY AND ASSESSMENT OF BEHAVIOURS
Most evidence on the efficacy of behavioural interventions is based on self-reported behaviour, and change in self-reported behaviour, as outcome. Assessment and reporting of sexual behaviour is subject to ascertainment and reporting bias. Such bias is particularly important in the context of behavioural intervention trials, because the intervention directly manipulates the desirability of certain reported behaviours, and subjects cannot be effectively blinded to the intervention. For behavioural intervention trials, STI and HIV incidence are the outcome measures of greatest interest. Unfortunately, trials that use STI and HIV incidence as outcome measure have not shown high levels of efficacy. Of the seven randomised controlled trials of behavioural interventions that measured HIV incidence as outcome, none were found to be efficacious. Of the 27 randomised controlled trials of behavioural interventions that measured STI incidence as outcome, 17 were found to be efficacious; however, the magnitude of intervention effect varied widely. None of the behavioural trials assessed sustainability of behaviour change over time.

BEHAVIOURS AND BEHAVIOUR SYSTEMS
Behavioural intervention trials that use self-reports of behaviour as outcome measure are more likely to demonstrate efficacy than those that use STI/HIV incidence as outcome measure. One reason for this discrepancy may be the focus on specific behaviours. Most studies of behavioural risk and behavioural interventions focus on specific behaviours such as condom use, sexual frequency, numbers of partners, age at sexual initiation, or choice of high/low-risk partners, and treat these behaviours as if they were autonomous and independent of each other. Some studies use composite behaviour scales; however, these tend to be simple additive measures. Careful observation and review of the literature suggest that such behaviours constitute interdependent components of complex behavioural systems and should be treated and assessed as such. Individuals who become monogamous may simultaneously stop using condoms; individuals who start using condoms may increase their numbers of partners; individuals who use microbicides may stop using condoms; individuals who initiate sex relatively late in life may accumulate new partners faster during their early years of sexual activity; individuals with high-risk partners may also engage in other high-risk activities such as substance use, unsafe sex, multiple partners and the like. Risk behaviours tend to cluster in population subgroups and during particular stages of life. Risk behaviours are related to each other, and the relationships among them are complex and may take many forms. Risk behaviours may be conditional—individuals may use condoms only with high-risk partners; they may cluster—individuals who engage in high-risk sexual practices such as anal intercourse may also have many partners, not use condoms, use drugs and alcohol, and have sex with other high-risk individuals; they may be compensatory—individuals with high-risk partners may use condoms and avoid high-risk practices such as anal sex. Moreover, the effects of a number of behaviours on STI/HIV incidence may be additive, conditional, synergistic or antagonistic. In addition, risk and preventive behaviours, and changes in them, interact with biomedical states and changes in such states. For example, individuals with HIV infection may be more (or less) likely to use condoms or avoid insertive anal intercourse. Similarly, individuals receiving antiretroviral therapy may be more or less likely to engage in risky behaviours. Behavioural assessments and interventions that do not consider specific behaviours to be inter-related components of complex behaviour systems may fail to describe and intervene in the related components of complex behaviour systems.
be subject to unexpected outcomes and unintended consequences that originate in the interdependencies among behaviours and between behaviours and biomedical states.

THE LIMITED RELATIVE IMPORTANCE OF BEHAVIOURS OF INDIVIDUALS

Recent research has shown that individuals’ own behaviours have only a limited effect on their chances of acquiring an STI including HIV.10 In the USA, while white Americans are at risk of acquiring STIs if they engage in risky behaviours, African–Americans are at risk of acquiring STIs even if they engage in normative behaviours.9 Individuals’ risk of acquiring STIs is highly dependent on the epidemiological context, their position in the sexual networks they belong to, and, more directly, on the behaviours and infection status of their sex partners. A person’s risk of acquiring an STI depends on his/her partners’ non-monogamy.10 More importantly, at the population level, spread of STI may be determined by presence and size of subpopulations marked by mutual non-monogamy where both partners have other partners.10

Our current understanding is that partners’ behaviours, structure of sexual networks, linkages among sexual networks, and individuals’ position in a sexual network all exert considerable influence on individuals’ risk of acquiring and transmitting STI and the rate at which STIs spread in populations. Such understanding points to the limited role that individuals’ own behaviours play in determining their STI risk. Thus, behavioural interventions aimed at changing individual behaviours may also be limited in their potential effects on STI risk and population level STI spread.
acquisition and transmission; (b) implement strategic interventions to prevent the spread of infection in populations. Informing the general population about the prevalence and demographic and geographic distribution of infections, the efficacy of condoms and other biomedical interventions such as microbicides and pre- and post-exposure prophylaxis, and the RR of particular sexual practices, is an intervention aimed at enhancing knowledge, an important preventive function that all public health programmes should adopt. Implementation of interventions aimed at reducing infection incidence at the population level is more complicated.15 Strategic decisions on the behavioural interventions to implement, the target populations for each intervention, the coverage and duration of implementation, and the costs, cost-effectiveness and expected population impact are marked by many difficult trade-offs. A recent analysis of optimum resource allocation for HIV prevention in the USA suggests that prevention efforts should be focused on HIV-infected people.17 An earlier framework had proposed a hierarchical ranking of subpopulations for prevention efforts ranging from infected persons with high-risk transmission behaviours to uninfected persons with low-risk behaviours.16 In any particular setting, the optimum mix of interventions will depend on the epidemiological, social and economic context and the available financial, human, organisational and cultural resources.

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