



Beyond combination prevention: understanding community-based prevention as a complex system

By Daniel Reeders and Graham Brown

What is combination prevention?

In a series on HIV prevention for *The Lancet* in 2008, Coates and colleagues describe combination prevention as behavioural, biomedical and structural approaches that are ‘combined strategically to address local epidemics’.¹

The concept originated as an analogy to highly active antiretroviral therapy. Instead of prevention ‘monotherapy’, it proposes to combine ‘potentially synergistic prevention activities’.² Coates et al., argue that behavioural interventions are ‘insufficient when used by themselves to produce substantial and lasting reductions in HIV transmission’.³ They suggest a multi-level approach is required that engages with individuals, couples, groups, networks, and communities, and integrates the behavioural, biomedical and structural aspects of prevention and treatment.

Put simply, the idea of combination prevention involves using a range of approaches simultaneously, at both the individual and higher levels, to respond to the needs of specific populations and address different modes of HIV transmission.

The discourse on combination prevention remains relatively vague about what strategy should guide the integration of programs in a combination prevention approach.^{4,5,6,7,8} The mere *addition* of complementary interventions is unlikely to achieve the bold targets that have been set for the global HIV response, even in a hypothetical scenario where they were perfectly integrated and coordinated.

Table 1: Features of combination prevention from UNAIDS guidance

- tailoring to national and local needs and conditions
- focus on the *mix* of programmatic and policy actions
- addressing both immediate risk and underlying vulnerability
- planned and managed to operate synergistically and consistently on multiple levels and over an adequate period of time
- requires and benefits from enhanced partnership and coordination
- includes mechanisms for learning and capacity building
- flexibility to permit continual adaptation to the changing environment

Source: UNAIDS⁹

These targets include the UNAIDS ‘90-90-90’ treatment goals (90% diagnosed, 90% on treatment, 90% achieving viral suppression) set out to be achieved by 2020.^{10,11}

The treatment goals are premised on the claim that the global epidemic is nearing a ‘tipping point’, a concept drawn from the science of complex systems and popularised by Malcolm Gladwell.¹² In a real world scenario, we know that ‘more is different’ – the components of a combination *can* interact synergistically, but with unexpected consequences.¹³ So it is surprising that the discourse on combination prevention has drawn so little on the science of complex systems to help understand these dynamics. Only *The Lancet* paper by Piot and colleagues mentions potentially relevant ideas such as complex adaptive systems and agent-based modelling.¹⁴

A recent scoping study by Graham Brown and colleagues suggests that most research on HIV prevention in developed countries has looked at one intervention

at a time, in isolation from both their potential interactions with other programs and the community and socio-political context of their implementation.¹⁵

New forms of research and approaches to policy making and strategy may be necessary to reach the full potential of combination prevention. This article will briefly review the findings of the scoping study and discuss what kind of research is needed to support planning and policy making for a genuinely systemic approach to HIV prevention. It will conclude by describing the work being done by the What Works and Why (W3) project to articulate the ‘system logic’ of peer and community based programs in HIV and hepatitis C prevention in Australia.

Findings from the scoping review

The scoping study looked at peer reviewed articles and grey literature (e.g., community published monographs and conference papers) from developed countries that were published between

2006 and 2013. The different kinds of intervention were categorised according to the framework used in *The Lancet* series¹⁶ and the September 2010 UNAIDS discussion paper on combination prevention¹⁷. The framework focuses on the level of social relationship or organisation that are targeted by HIV prevention interventions: from individuals and couples, groups and networks, to community and society. The scoping study reviewed papers for evidence and possible quality indicators for policy makers and program planners seeking guidance on how programs that work on different levels can be combined. The full findings have been published as a research monograph¹⁸ and this section will summarise its three main themes.

1) **An overwhelming focus on individual behaviour change**

The vast majority of studies reviewed were found to focus on formal, structured programs, underpinned by theories drawn from social psychology and health behavioural models, assessing short-term (up to 12 months) impacts on individuals.

2) **Evaluation of isolated effects rather than interactions**

The published literature was dominated by controlled trials using individually or group-randomised, or matched-case or quasi-experimental designs, where program activities stick closely to a standard protocol. These studies sought to measure the effect attributable to each intervention or program on its own, excluding effects attributable to interactions with other programs and the local community and socio-political context.

3) **Limited evidence on how to adapt programs to changing circumstances or to implement them in new contexts**

Developed countries like Australia have existing and often relatively well established and integrated programs for HIV prevention. Many of the included papers reflected the assumption that the interventions being tested would be implemented for the first time; few presented evidence on how to go about adapting existing programs to maintain or improve their effectiveness within the continually changing social and

scientific context of prevention. Few offered ‘program theories’^{19,20} that identify what mechanisms produce outcomes in context²¹ and offer guidance on what *functions* need to be preserved when interventions are adapted for new settings²².

What kind of research is needed?

Achieving ‘systemic prevention’ calls for a different approach to research. Rather than seeking to measure standalone effects for interventions in isolation from each other and abstracted from their context, research should help answer the policy-maker’s question: *what works, for whom, under what circumstances, and why?*²³ This question is about directing investment to where it can have the greatest impact. The answers are ‘complex’ in the sense of being *layered*²⁴ with knowledge about the activities, the context and target audience, not just average effect sizes.

Research is also required that informs a *strategy of combination* among programs that target and work on different levels. Understanding communities as complex adaptive systems^{25,26} enables research to identify local patterns of interaction and adaptation that create levels and emergent effects that are relevant to HIV prevention strategy. Such understandings may help identify ‘leverage points’ where investment in activities may be multiplied by the system into larger, more sustainable outcomes.²⁷

New methods are needed that focus on interactions between programs and between programs and context and their effects.²⁸ Systems science provides an expanded vocabulary for describing these interactions in terms of their behaviour over time, which might display delayed effects, feedback loops and more complex attributes like non-linearity and emergence.²⁹

For example, a multi-level, community-wide campaign may have delayed effects and if policy makers only looked at surveillance data, the situation might appear unchanged or even worse, even though the intervention was working as intended.

Non-linearity is reflected in the idea of ‘synergy’, where combinations have exponential rather than additive effects. Meeting the UNAIDS targets *depends* on this, but there is a lack of research and evidence on strategies to achieve it. Synergies can also occur in causal pathways

that produce risk and vulnerability, and these can also be subject to delayed effects: this is reflected in the popular idea of ‘tipping points’ that only become apparent when it’s too late to intervene in them.

The UNAIDS guidance on combination prevention calls for research to spell out and evaluate multi-step causal pathways between distal influences and risk behaviour.³⁰ What gets overlooked is that these ‘pathways’ are *predictions*. The more complicated these predictions are, the more likely they will turn out to be irrelevant or wrong, due to the rapid pace of change in the social environment around the program. Research can contribute here by describing and theorising ‘mechanisms’ – accounts of the ways in which program activities engage with social processes to produce outcomes of interest.³¹

Finally, programs generate knowledge as they adapt both to developments in prevention science and continual changes in their environment and communities. The knowledge they produce is strategically valuable, because rapidly changing environments impact on all prevention initiatives, but changes may take some time to appear in research findings. However, funding and evaluation arrangements can stifle the flexibility required for peer and community based programs to continually refine their effectiveness in changing circumstances.

Researchers can partner with community-based organisations and programs to develop new ways to strengthen, package and share this knowledge within the sector. This shifts the role of researchers from conducting independent evaluations to facilitation and strengthening of existing knowledge practices. The next section briefly describes work being done in the W3 project to explore this approach with peer-based programs.

Increasing knowledge sharing among peer based programs

The ‘Understanding What Works and Why’ (W3) project was funded for 2014–16 by the Commonwealth Department of Health to develop a monitoring, evaluation and learning framework for peer and community based programs in HIV and hepatitis C. In contrast with the majority of published literature reviewed in the scoping study (see above), the contribution of peer and community

based programs to the Australian HIV response is characterised by three things:

- flows of knowledge developed from peer insights enable programs to engage with, influence, and adapt to their constantly changing community and policy environments
- constant interaction with other programs – for instance, the way a needle and syringe program is a crucial referral node in a network of related clinical and social services
- influence across *multiple* levels – knowledge from one-on-one and small group work is frequently captured and used in the development of health promotion resources and messages for policy advice and participation.

The project aims to map out and theorise the ‘system logic’ of peer and community based programs. This has generated insights into how these programs interact across different levels and interfaces within their target communities and broader prevention systems. So far, the project has identified four key functions that any peer and community based program needs to fulfil in order to be effective in the medium term and sustainable in the long term. These functions are: Engagement, Adaptation, Influence and Alignment. The next year of the project involves working with partners to identify program-specific indicators of quality and effectiveness for each of the four key functions.

System mapping allowed the identification of different ‘scopes’ within the prevention system, based on kinds of knowledge generated by program activities. For instance, the *scope* (or ‘knowable horizons’) of health promotion differs greatly from that of counselling and clinical practice, which are more focused on individuals; it is also far removed from the clinical outcomes aggregated in epidemiological surveillance. Partnering between disciplines therefore involves *translation* between perspectives.³² This must be done well in order to genuinely integrate the contribution of behavioural, biomedical and structural approaches in a prevention system.

Conclusion

Reading the guidance on combination prevention together with the goals that have been set nationally and internationally for prevention, it should

be clear that simply adding prevention approaches together is not going to be sufficient. Research needs to engage with complex systems theories and methods in order to support policy makers and practitioners to create genuine prevention systems that engage the capacities of affected communities on multiple levels of adaptation and agency.

The W3 project blog can be visited online at: <http://www.w3project.org.au>

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Daniel Reeders is Understanding What Works & Why (W3) Project Research Officer at the Australian Research Centre in Sex, Health and Society (ARCSHS), La Trobe University. Dr Graham Brown is W3 project lead and Senior Research Fellow at ARCSHS, La Trobe University.