

doi: 10.1111/1753-6405.12867

What happens once a program has been implemented? A call for research investigating strategies to enhance public health program sustainability

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Substantial investments have been made by governments internationally in the provision of public health programs and services. There is now broad acceptance of the need to improve the potential benefits of such investment through enhanced implementation of evidence-based programs at-scale.¹ The prevailing emphasis on implementation as a vehicle for public health improvement is illustrated by the establishment of national funding schemes for implementation and dissemination research, and the proliferation of speciality implementation science training opportunities to support the development and application of the science of implementation in health service. As a consequence of such developments, there has been considerable growth in implementation-related research. Public health indexed publications in Medline with 'implementation' in the title have increased from 917 in the year 2007 to 2,858 in the year 2017,² and the leading speciality journal *Implementation Science* has seen a seven-fold increase in submissions over the same period.³

Much of the focus of implementation research has been on identifying factors associated with, or strategies that can improve, the initial uptake or implementation of evidence-based interventions. Although such research is warranted as achieving sufficient implementation of interventions to improve health represents a considerable challenge, unless implementation of public health programs is maintained longer-

term, the value of investment in initial implementation is open to question.⁴ The prospects of sustained implementation, even following substantial investment in initial implementation, are by no means guaranteed. 'Initiative decay' or the 'improvement evaporation effect' whereby the gains of improvement interventions are not sustained is common. Of the 17 studies identified in a systematic review of the sustainability of American and Canadian health-related programs (which were primarily community-based), just four reported achieving program sustainability of at least one intervention component in at least 80% of intervention sites.⁵ Similar findings have been reported in a review of 125 studies on sustainability of program effects in the fields of public health and medicine.²

Broadly, sustainability is considered as the continued use of program components and activities for the continued achievement of desirable program and population health outcomes.⁶ Much of the research examining program sustainability has examined factors that are associated with program sustainability following withdrawal of program funding or an initial implementation phase.² Such research has typically been non-experimental and focused on characteristics of the program (or intervention), organisational capacity, or broader contextual factors as correlates of sustained implementation fidelity.² Research suggests that establishment of systems, processes and structures within organisations

adopting new health programs, and building of organisational readiness and capacity that occur as part of initial implementation efforts may facilitate sustained program implementation.⁷ While this research has provided important formative work for the field, to maximise the benefits of investments in population-wide program implementation, policy makers and practitioners are primarily interested in whether planned investments are sufficient to maintain long-term program implementation or whether ongoing investment is required to achieve this outcome. The most robust research to address such questions are intervention trials where strategies to improve the sustainability of implementation outcomes are compared to alternate strategies or usual care control groups.

We recently sought to assess the effectiveness of implementation strategies in sustaining improvements in implementation of non-communicable prevention policies or practices in community settings. We examined all trials included in a series of systematic reviews funded by The Australian Prevention Partnership Centre.^{4,8-10} The reviews included trials (randomised and non-randomised) with a parallel control group that examined the impact of an implementation strategy on the fidelity of implementation of a policy or practice by a school, childcare centre, workplace or sporting venue. Studies of policies or practices that targeted diet, physical activity, obesity, tobacco or alcohol use were eligible.^{4,8-10} Consistent with definitions used in previous reviews, sustained implementation was defined as sustaining a statistically significant intervention effect on a measure of implementation fidelity achieved post-intervention for at least three months thereafter. Therefore, to be included in the study, trials were required to have assessed the impact of implementation strategies on policy or practice implementation at three time-points (pre-intervention, post intervention and at least three months after) and to have reported statistically significant effects on at least one implementation outcome at the first post-intervention assessment period.

Of the 108 full texts examined, we did not find any trials that met our inclusion criteria. That is, not a single trial identified

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The authors have stated they have no conflict of interest.

across four comprehensive reviews^{4,8-10} reported a significant effect on at least one implementation outcome post-intervention and further assessed if such effects were maintained at a longer-term follow up. We also re-analysed data collected as part of a bibliographic study of all 1,648 manuscripts published in 10 leading public health journals in 2013 and failed to identify any trials assessing the sustainability of program implementation.¹¹ While concerning, the findings are perhaps unsurprising. Previous systematic reviews on the issue have consistently commented on the nascent state of sustainability research in the field of implementation, and limited use of experimental research designs.^{2,6}

The lack of such research is likely a reflection of the considerable challenges in undertaking sustainability trials. Improvements in the initial implementation of evidence-based public health programs are difficult to achieve and, in many cases, initial implementation efforts are ineffective, leaving nothing to 'sustain'.² Further, measures of program implementation, and its maintenance, often occur at the organisational level necessitating the participation of large numbers of organisations (e.g. schools, outpatient clinics, sporting clubs) in trials to enable quantitative methods of analysis – trials of a scale beyond the capacity of most research groups. Assessing sustainability also requires extended periods of program follow-up, typically measured in years.⁶ Given such challenges with assessment of sustainability, trialists may need to consider measuring variables known to predict sustainment (i.e. relevant partnerships, organisational capacity) in the earlier stages of program planning. While not directly assessing causality, program planners may need to consider the use of a range of study designs including well-designed, non-experimental prospective designs in the evaluation of program sustainability.

While public health history is littered with examples of effective public health programs that were discontinued when external funds to support implementation have ceased or following attempts to transfer responsibility for ongoing program delivery,⁶ a number of case studies in Australia and elsewhere have demonstrated that sustained implementation of public health programs is possible.^{6,7,12} Developing an understanding of the success factors for such cases is important.

However, rigorous development and testing of strategies that are effective in enhancing program sustainability is urgently needed if the ongoing implementation of beneficial programs is to become the norm, not the exception.

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