

Evaluating Home-Based, Multicomponent, Multi-Trigger Interventions

Your Results May Vary

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Introduction

In public health, we operate in a world of tight resources, making the best decisions possible to maximize benefits to people with asthma, their families, and our communities. The use of evidence-based interventions is an effective way to build on experience by implementing interventions that have shown previous effectiveness. The systematic review published in this supplement to the *American Journal of Preventive Medicine* was completed in order to identify effective asthma interventions for reducing asthma morbidity in a community setting.¹⁻³ The plan is to use the information to guide funded programs on how to best allocate their resources, as well as to direct our own research and evaluation efforts at the national level. Home-based asthma interventions were chosen for the review in order to focus on efforts to reduce indoor asthma triggers because this type of intervention is used more and more at the state level, and there is not much information summarizing the effectiveness of these interventions on a community level.

The two *Guide to Community Preventive Services (Community Guide)* reviews^{2,3} together are invaluable resources to help us make the right decisions for our programs and, ultimately help people with asthma and their families. These *Community Guide* reviews are exciting: They give us evidence that home-based environmental interventions can improve the lives of children with asthma and their families. Moreover, moderate-intensity interventions can be cost effective.

The Air Pollution and Respiratory Health Branch at the CDC is committed to working with state asthma programs to implement effective home-based environmental interventions. As this new information is incorporated into program planning, it is important to re-

member that the reviewed interventions varied widely in scope and intensity; the study results varied widely as well. These types of interventions can be implemented successfully in many ways. Projects vary by the number of home visits, the type of home visitor, the types and extent of activities done in the home, and the extent of educational services provided. As we work with states to implement the *Community Guide* recommendation, we can and should expect that implementation results may vary.

Given this variation, how can we be assured that the scope, intensity, and myriad other details associated with adopting and running an intervention are producing the results we need for our community? Systematic reviews are designed to summarize generalizable research, not to tell us what will be most effective for a specific community's context.⁴ Nor can reviews tell us how to operate efficiently given administrative context and resources.⁵ Reviews can point us in a particular direction, but we cannot expect them to provide us with the map. Particular interventions as delivered in respective communities must be routinely evaluated to ascertain whether programs are appropriately implemented and are achieving the expected results.^{6,7} Program evaluation is necessary to ensure that the right things are being done, and being done correctly.

Are We Doing the Right Things?

While the research analyzed in the reviews indicates that asthma interventions should address multiple triggers, be conducted in-home, and have multiple service components to be successful, no specific mix of services can be identified as right for all communities and all settings. The studies included in both reviews show a variety of approaches and models chosen to accomplish certain goals. Overall, seven intervention components were identified. All included at least one environmental component (assessment, education, or remediation) to reduce exposure to multiple indoor asthma triggers. Most programs studied as part of this review also included additional components such as self-management training, social support, and coordinated care, in conjunction with ef-

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forts to reduce triggers in the home. The intensity or “dose” of each component varied, as did the type of provider and providing agency. Further, the context of the programs, which reflects the social, ecologic, and political environment of the community, all affect the success of public health programs.⁸ Which mix will be right for a given community?

The reviews do not compare the relative values of components and services across the individual studies. Given the diversity of communities and the critical role community context plays, such comparisons would have limited value.^{6,7} To answer that question and make the best decisions, especially as changes occur in the community over time, information will be needed at the community level to guide the adaptation and enhancement of the programs. Conducting evaluations that look at program outcomes will provide information to know whether the selected program components are effective in specific communities and populations. Evaluations can be designed to show which components and mix of services are working well and for whom, where problems exist, and what specific factors contribute to successes and challenges. This information can be used to support and invest in what works, and to target changes to revise what does not work.

Outcome evaluation can also be used to help ensure that program components remain effective over time. Populations and community context continually change. By routinely monitoring changes in program effectiveness and periodically evaluating programs, programs can be adapted to better fit specific communities to promote continued successful endeavors.

Are We Doing Things Right?

To achieve positive outcomes for children, families, and the community, things must be done right. Program operations need to be designed to use resources to their optimal effectiveness. Systematic reviews are not designed to provide specifics of how or how well interventions are implemented. No standards or benchmarks to measure program implementation have been established. Together with our partner state programs, we need to evaluate processes and outcomes to help us learn what critical program elements must be in place to plausibly affect desired change. Process evaluations often bring to light problems or barriers encountered in delivering services, indicating that the program model should be revised. At other times, process evaluation shows us innovations in practice that can result in better operations. In this way we will build evidence to promote effective practice.

In addition, process evaluation is essential to ensure that a program is operating efficiently. Any comprehensive health endeavor such as home-based, multicomponent, multi-trigger interventions requires major resource investments. As stewards of scarce resources, managers of asthma programs are accountable for the program operations. Well-designed process evaluation can identify problems and solutions to correct them. Activities and services need to be well organized and economical. Efforts should be coordinated and not duplicated. In this manner, process evaluation is a necessary precursor to economic evaluation. The cost-effectiveness review tells us that minor-to-moderate intensity, in-home, environmental interventions are a good value. However, costs vary across programs, and each program will need to track investments to ensure that they are doing things right and achieving value.⁹ Both of these reviews^{2,3} highlight programs with a wide range of costs that are still effective. This allows asthma programs to choose interventions that match their available resources.

Finally, process evaluation can help us document how our project operates and what works, to allow the sharing of lessons learned with others. By sharing evaluation findings widely, programs can add to the knowledge base about what works (or does not) in which contexts.¹⁰ Better models and tailored service mixes can be identified, and future decisions can be better informed.

How Can We Use These Reviews to Help Us Evaluate?

Fundamentally, program evaluation is essential to all public health practice,^{11,12} and the CDC actively promotes this evaluation through a variety of mechanisms. However, interventions with many components in specific environments are challenging to evaluate.¹³

Fortunately, much of the information included in these reviews^{2,3} can provide a foundation to guide evaluation. The analytical framework is an excellent tool to guide in developing an evaluative description of an environmental intervention. The framework can serve an expository role, showing the underlying logic of the components of an intervention. By adapting and tailoring it to their own experiences, program designers can easily create a logic model, or visual representation, of how their program is intended to cause change. This program-specific logic model can be used as a roadmap for developing and prioritizing evaluation questions, defining and sequencing indicators, and guiding data analysis.^{9,14}

Both reviews^{2,3} also summarize and highlight specific program indicators that were used in the included studies. These proven indicators form a ready-made pool from which evaluators can draw.¹⁵ In addition, although

the studies included in these reviews were designed primarily as research, the approaches and methods can often be adapted for evaluations. Reviewing these studies can highlight the types of data and information generated by different design options.

Results Will Continue to Vary

The *Community Guide* review of asthma interventions^{2,3} provides an evidence base to promote in-home, environmental interventions and an expectation that the interventions, when tailored to the community and implemented successfully, will improve the lives of children with asthma and their families. To ensure that effective programs are continually implemented and sustained, we recommend that asthma programs build evaluation into all of their program components and systematically use evaluation findings to enhance and improve programs. To assist in program evaluation activities, the publication *Learning & Growing Through Evaluation: State Asthma Program Evaluation Guide* is available at www.cdc.gov/asthma/program_eval/guide.htm.

Using evaluation findings within programs helps us make decisions that will improve implementation and achieve even better results. Evaluation findings that are shared with the broader asthma community add to the knowledge base, enabling us to learn about effectiveness within community contexts and add to the evidence base.^{16,17} Further, program evaluation enables us to learn what works in practice,¹⁸ providing lessons learned to be shared with others. Collecting and sharing local evaluation data allow communities to select intervention opportunities with the highest potential impact, to continually learn from experience,^{19,20} and build community support to sustain success.²¹ Ultimately, results will always vary, but successes can be multiplied.

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