doi: 10.1111/1753-6405.13023

Improving the impact of public health service delivery and research: a decision tree to aid evidence-based public health practice and research

Luke Wolfenden,[1,2] Christopher M. Williams,[1,2] Melanie Kingsland,[1,2] Sze Lin Yoong,[1,2] Nicole Nathan,[1,2] Rachel Sutherland,[1,2] John Wiggers[1,2]

1. School of Medicine and Public Health, The University of Newcastle, New South Wales
2. Hunter New England Population Health, New South Wales

Despite the benefits of conducting evidence-based practice, many public health initiatives remain unsupported by evidence[1] and public health policies and practices that have been shown to improve health outcomes are not routinely implemented.[2,3] Maximising the impact of public health interventions requires policy-makers and practitioners to use robust evidence to consider both 'what' interventions are effective in addressing public health issues and 'how' such interventions can best be implemented into practice. However, organisations that deliver public health initiatives face a range of barriers including a lack of skills and capacity when using and generating evidence to aid such decision-making.[4,5] The development of decision support tools has been suggested as a useful strategy to help overcome such barriers.[6]

Decision trees are frequently used tools in health care to assist clinicians to make evidence-based diagnostic and therapeutic decisions.[7] Such tools may also be useful for public health policy and service delivery organisations to aid their selection of evidence-based interventions and implementation strategies, and also to identify where further evidence needs to be generated. While a number of process models and decision trees for the medical and nursing field have been published,[3,8] few of these address consideration of evidence-informed implementation strategies or evidence generation needs.

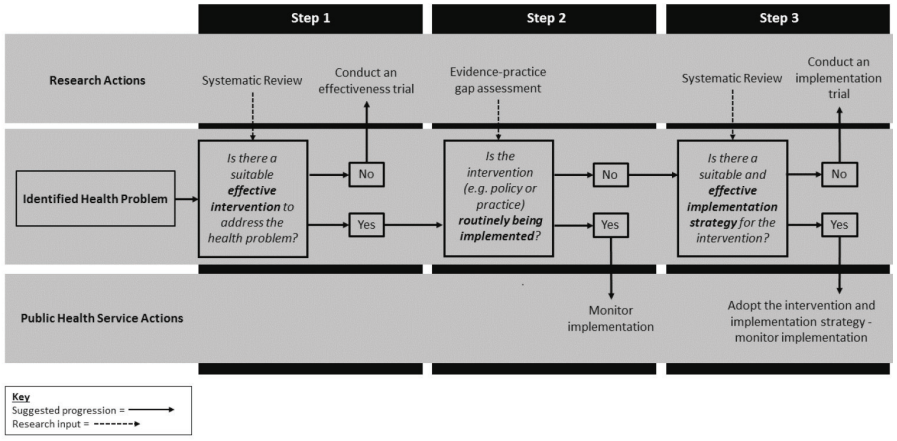
In this editorial, we describe a decision tree (Figure 1) developed and utilised in a large public health organisation in NSW, Australia.[9]

The decision tree tool aims to assist in the application of research evidence to maximise the impact of public health programs and services. The tool helps identify when there is sufficient evidence to support the delivery of particular services, and when there is not. The latter outcome provides an indication of where further research may be needed, identifying opportunities to undertake policy and practice relevant research. At each step in the decision tree, users are posed a question, and based on their response, a service and/or research action is suggested. Health services may have the capacity and expertise to conduct research actions or they may need to commission, partner or collaborate with researchers to do so. This tool should be used with other resources such as the Intervention Scalability and Assessment tool to determine intervention suitability for scaling up.[10] Such assessments need to consider end-user values, resource, capability and context.

Step 1. Assessment of intervention options to address health problem

The Public Health Research and Practice Decision Tree starts at the point where the public health service organisation requires information regarding effective interventions to address an identified health problem. Systematic reviews are a recommended source of such evidence.[11] Health services could employ or train staff, or engage a research organisation to critically appraise the findings of such reviews where they exist, or undertake a review where a contemporary review does not meet their needs. If a review identifies that effective interventions exist, the decision-maker moves to Step 2 of the tree. If the review identifies either: i) an absence of evidence regarding the impact (adverse or beneficial) of interventions on the health issue; ii) insufficient evidence; or iii) effective interventions that are not suitable for implementation in the local context, (e.g. cannot feasibly be delivered at scale), the conduct of further research is desirable to support intervention selection. Other frameworks have described factors that need to be considered when determining the suitability of an intervention for scaling up, including the severity of the problem it is seeking to address, the strategic/political context, the intervention costs and benefits to the organisation, fidelity and adaptation to the original program, reach and acceptability, delivery setting and workforce, implementation infrastructure and sustainability.[12] To meet this evidence need, public health service organisations

Figure 1: Public Health Practice and Research Decision Tree.



could undertake research, partner with a research organisation, or commission such a trial to test the impact of a new or adapted intervention that aligns with the health service values, capability, infrastructure and context.

Step 2: Assessment of evidence-practice gaps

Once an effective intervention option has been identified or developed, an assessment of the extent to which it is currently being implemented in practice is required (evidence-practice gap assessment).[13] Such assessments identify service delivery gaps that may benefit from investment in strategies to improve intervention implementation. Given the importance of equity for many service organisations, this assessment should address gaps in implementation across population sub-groups. Evidence-practice gap assessments can be conducted by service delivery staff or in partnership with researchers through an analysis of routinely collected administrative or service data, or by purpose-specific data collection activities including surveys, stakeholder engagement processes, or service delivery observations. If an evidence-gap assessment reveals effective interventions are being routinely implemented, and according to a sufficient standard across population sub-groups, no further investment in enhancing implementation is required. Nonetheless, a monitoring strategy is recommended to ensure implementation is maintained. Existing public health surveillance systems could be used for this purpose,[14] or local monitoring or data collection systems could be developed.

Step 3: Assessment of implementation options

When an evidence-practice gap for a suitable and effective intervention is identified, the service organisation needs to identify effective strategies to ensure adequate implementation of the intervention. Again, systematic reviews can be used or undertaken to assess the effectiveness of implementation strategies. However, the effects of implementation strategies are likely to be contextually dependent, and so the selection of appropriate strategies should also be guided by local data on implementation barriers. Together with systematic review evidence, the use of theoretical frameworks can help to select potentially effective strategies to overcome implementation barriers that have been identified locally.[15] Effective and contextually relevant strategies that can be feasibly delivered within the resources and infrastructure available should be preferenced and employed to implement the intervention. Ongoing monitoring is also recommended to: i) ensure the implementation occurs as planned; ii) afford early identification and response to implementation or sustainability challenges; and iii) provide a mechanism for performance accountability.

If no effective and contextually appropriate implementation strategies are identified through this process, public health services may undertake, partner or commission an implementation trial to test the impact of an appropriate implementation strategy.

Conclusion

The decision tree is a simple resource intended to assist health service practice and to foster the conduct of practice relevant research. The tree has the potential to improve the impact of public health research by identifying opportunities where the enhanced alignment of research with the evidence needs of end-users is needed.

References

1. Indig D, Lee K, Grunseit A, et al. Pathways for scaling up public health interventions. *BMC Public Health.* 2018;18:68.
2. Wolfenden L, Nathan N, Janssen LM, et al. Multi-strategic intervention to enhance implementation of healthy canteen policy: A randomised controlled trial. *Implement Sci.* 2017;12:6.
3. Hills A, Nathan N, Robinson K, et al. Improvement in primary school adherence to the NSW Healthy School Canteen Strategy in 2007 and 2010. *Health Promot J Austr.* 2015;26:89-92.
4. Oliver K, Innvar S, Lorenc T, et al. A systematic review of barriers to and facilitators of the use of evidence by policymakers. *BMC Health Serv Res.* 2014;14:2.
5. Tabak RG, Padek MM, Kerner JF, et al. Dissemination and implementation science training needs: Insights from practitioners and researchers. *Am J Prev Med.* 2017;52:S322-S9.
6. Yost J, Dobbins M, Traynor R, et al. Tools to support evidence-informed public health decision making. *BMC Public Health.* 2014;14:728.
7. Podgorelec V, Kokol P, Stiglic B, et al. Decision trees: An overview and their use in medicine. *J Med Syst.* 2002;26:445-63.
8. Titler MG, Kleiber C, Steelman VJ, et al. The Iowa model of evidence-based practice to promote quality care. *Crit Care Nurs Clin North Am.* 2001;13:497-509.
9. Wolfenden L, Yoong SL, Williams CM, et al. Embedding researchers in health service organizations improves research translation and health service performance: The Australian Hunter New England Population Health example. *J Clin Epidemiol.* 2017;85:3-11.
10. Milat A, Lee K, Conte K, Grunseit A, Wolfenden L, van Nassau F, et al. Intervention Scalability Assessment Tool: A decision support tool for health policy makers and implementers. *Health Res Policy Syst.* 2020;18(1):1.
11. Chambers D, Wilson PM, Thompson CA, et al. Maximizing the impact of systematic reviews in health care decision making: A systematic scoping review of knowledge-translation resources. *Milbank Q.* 2011;89:131-56.
12. Milat AJ, Bauman A, Redman S. Narrative review of models and success factors for scaling up public health interventions. *Implement Sci.* 2015;10(1):113.
13. Kitson A, Straus SE. The knowledge-to-action cycle: Identifying the gaps. *Can Med Assoc J.* 2010;182:e73.
14. Conte KP, Groen S, Loblay V, et al. Dynamics behind the scale up of evidence-based obesity prevention: Protocol for a multi-site case study of an electronic implementation monitoring system in health promotion practice. *Implement Sci.* 2017;12:146.
15. French SD, Green SE, O'Connor DA, et al. Developing theory-informed behaviour change interventions to implement evidence into practice: A systematic approach using the Theoretical Domains Framework. *Implement Sci.* 2012;7:38.

Correspondence to: A/Prof Luke Wolfenden, Hunter New England Population Health, Locked Bag 10, Wallsend, 2287 NSW; e-mail: luke.wolfenden@health.nsw.gov.au