Rethinking evaluation for public health improvement:
Learning health systems for prevention

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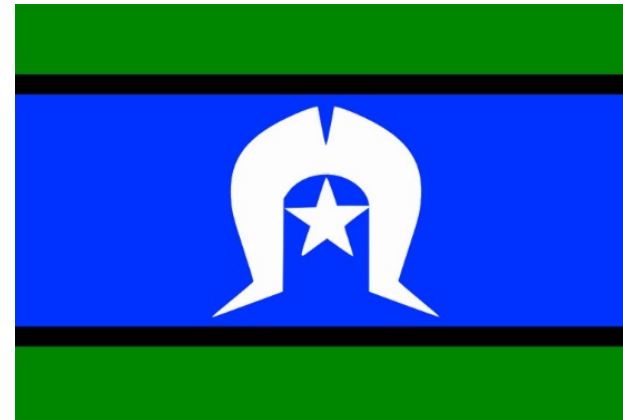
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Acknowledgement of Country

I would like to Acknowledge the original custodians of this land and pay my respects to the Elders both past, present and future.
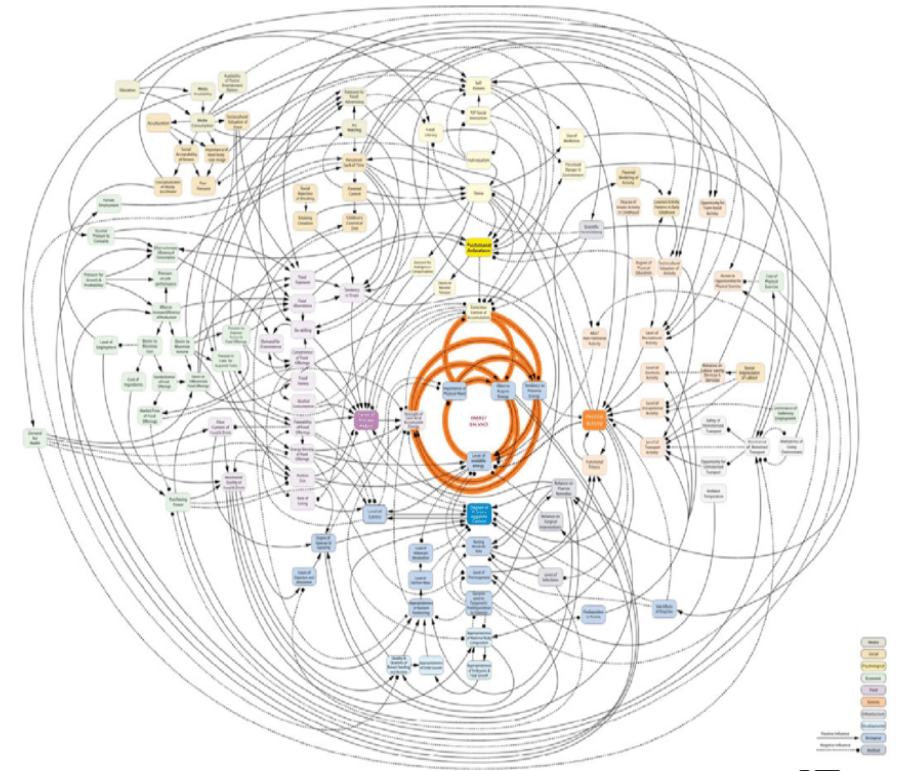
Population health interventions

- Aetiology of chronic disease and risk factors are complex

- Evaluations of population health programs suggest many have no beneficial effects in the real world

- Often this is attributable to:

  - Poor 'fit' of the intervention

  - Lack of an effective implementation strategy

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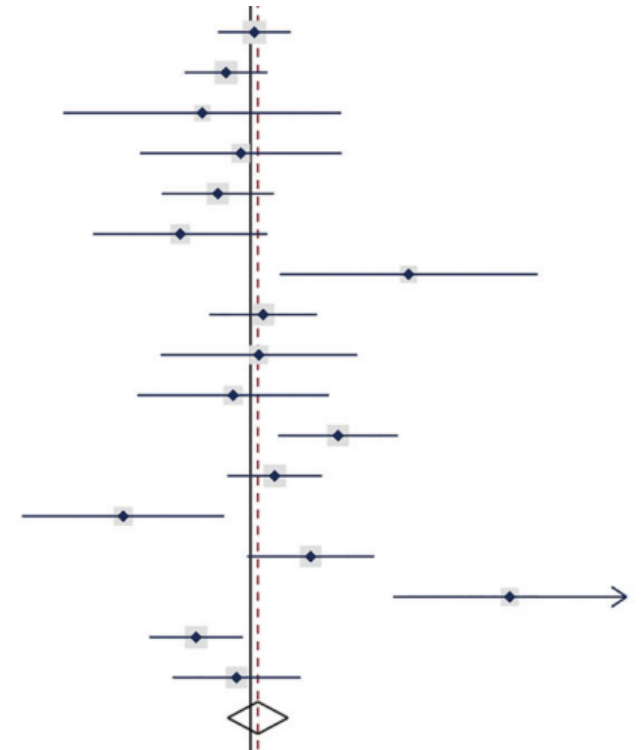**IMPLEMENTATION SCIENCE**

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Finch M, et al. Effectiveness of centre based-childcare interventions in increasing child physical activity: a systematic review and meta-analysis for policy makers and practitioners. Obesity Reviews 2016. Yoong SL et al. Exploring the impact of pragmatic and explanatory study designs on outcomes of systematic reviews of public health interventions: a case study. J Pub Health. 2014;36 170-176

Population health interventions

- Selection of effective interventions, and implementation strategies is a considerable challenge

- Effects heterogeneous

- Rigid interpretations of the evidence-base leave public health policy makers few options to address wicked problems

- Difficult to identify what works for whom in what context.
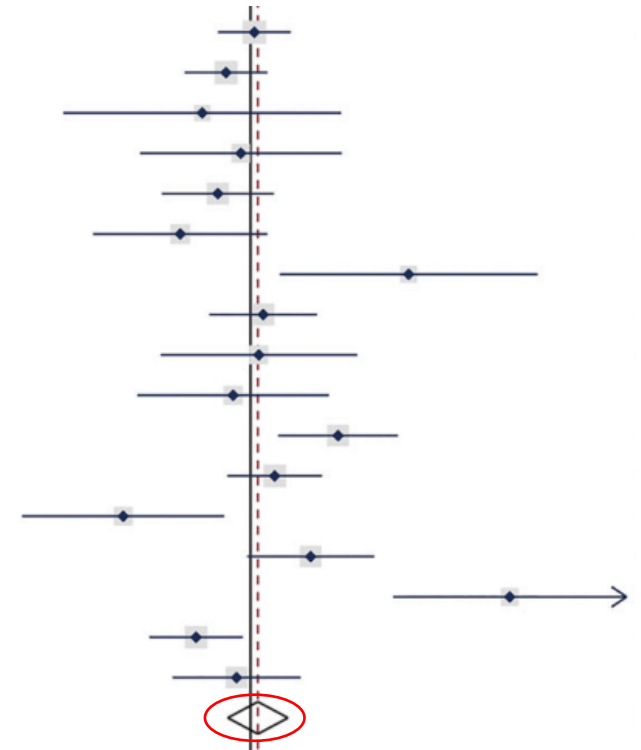

Love et al, Obesity Reviews, 2018

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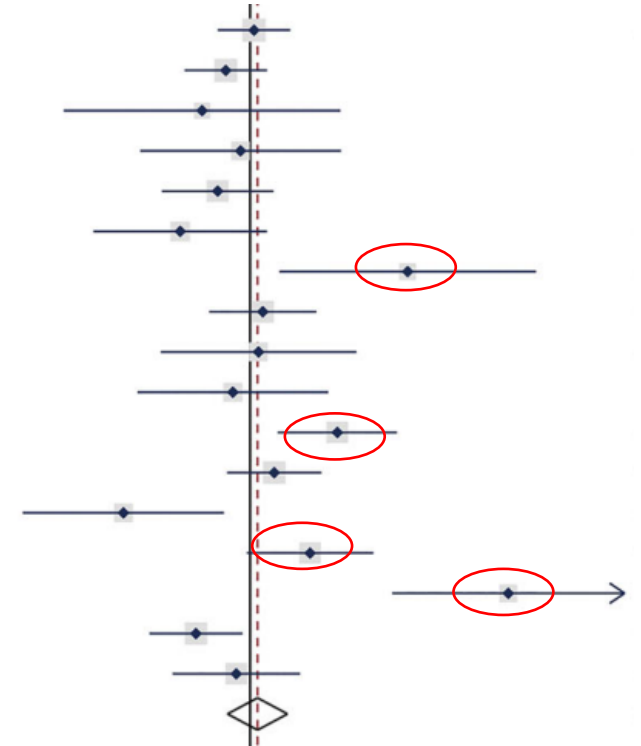
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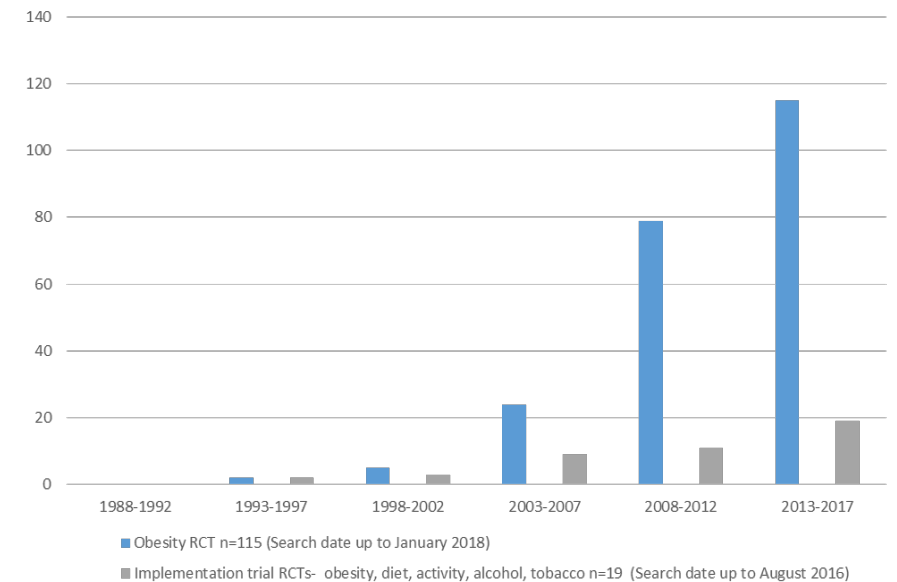# Current methods of evidence generation are tremendously inefficient in informing practice

Science is a cumulative industry

- Progression is slow and incremental

- Requires capacity to compare and learn from past studies

- May stagnate in instances where this does not occur, or few trials produced

New models are required where...

- Research is conducted in the contexts it is to be applied, with end-users who will apply it

- Employ harmonised methods (where possible) and builds directly off prior knowledge

- Seek to also contribute generalised knowledge

Cumulative number of school-based RCTs of obesity interventions; and RCTs of school-based implementation strategies for all SNAPO risks

- Obesity RCT n=115 (Search date up to January 2018)
- Implementation trial RCTs- obesity, diet, activity, alcohol, tobacco n=19 (Search date up to August 2016)

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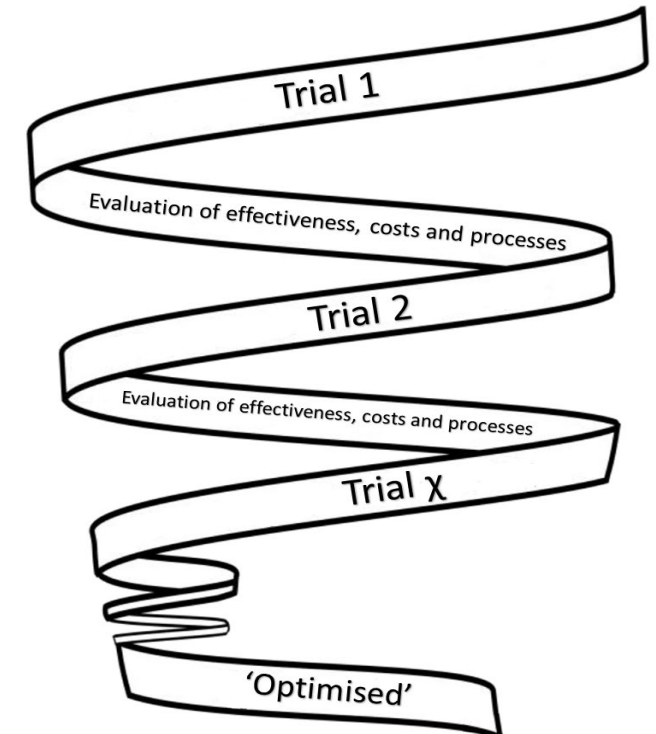# New approaches for public health improvement

Learning health system

- *"...continuous improvement and innovation, with best practices seamlessly embedded in the delivery process and new knowledge captured as an integral by-product of the delivery experience"*

Optimisation

- *"A deliberate, iterative and data-driven process to improve a health intervention and/or its implementation to meet stakeholder-defined public health impacts within resource constraints"'*
- Requires stable partnership, infrastructure, and supportive systems to collect and apply data for improvement

Challenges existing approaches

- Undertaken with/by health services, for health services, in their local context
- Ongoing and iterative

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New approaches for public health improvement

- Hunter New England Population Health has used an embedded model – other collaborative approaches used elsewhere

- Integration of service delivery and evaluation with no distinction between research & practice/service

- Optimisation applied to the development of interventions and strategies to implement them

- Yielded health service and community health improvements

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Some case studies..

Each have adopted an sequential RCTs approach

- The SWAP-IT healthy lunch-box intervention was optimised to reduce intervention costs by 95% while retaining effects on student diet

- A strategy to improve the implementation of healthy canteen policies was optimised to almost double its effectiveness (16 to 27%) and halve its cost per policy compliant school to ($4730 to $2627)

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What have we learnt...

On the whole the approach has been remarkably successful

But..

- Sequential randomised trials take time
- Effects sizes diminish at each phase (requiring increasingly greater sample)
- Mechanistic understanding is elusive..
- Bringing together statistical, mechanistic, and economic disciplines is a real challenge

Examining other methods of optimising to address these issues

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