

Translational research, research methods and data analytics

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Role of research in healthcare and public health

Evidence
Evaluation
Research
Policy
Impact
Health care
Social care

- Health research has high value to society.
- Central pillar of evidence based medicine
- It can provide important information about:
 - disease trends and risk factors;
 - effectiveness of treatment or public health interventions;
 - patterns of care and service provision, and
 - health costs and efficiency.



Research investment



- Biomedical research has been estimated to consume almost a quarter of a trillion US dollars globally every year.
- About 85% of global health and medical research investment is wasted (\$200 billion annually)¹
- A consistent findings from clinical and health services research is the failure to translate research into practice and policy ²



1. Chalmers I, Glasziou P. Avoidable waste in the production and reporting of research evidence. *Obstetrics and Gynecology* 2009; 114(6): 1341-1345.
2. Grimshaw et al 2012 Knowledge Translation of Research Findings. *Implementation Science* 2012;7:50 <https://doi.org/10.1186/1748-5908-7-50>



Evidence – practice gap



- Most research is not translated into practice. (Newson et al 2015)
- The process of translation when it occurs is often “slow and haphazard” (Morris et al, 2011, Milat et al 2013)
- On average it takes 17 years to move research into clinical practice (Morris et al, 2011)
- In prevention can take between 5-12 years to move research into practice (Milat et al 2013)

- Morris Z S, Wooding S, Grants J (2011). The answer is 17 years, what is the question: understanding time lags in translational research. J R Soc Med. 2011 Dec; 104(12): 510–520.doi: 10.1258/jrsm.2011.110180
- Milat et al (2013). Policy and practice impacts of applied research: a case study analysis of the New South Wales Health Promotion Demonstration Research Grants Scheme 2000-2006. Health Res Policy Syst. 2013 Feb 2;11:5. doi: 10.1186/1478-4505-11-5
- Newson, R., King, L., Rychetnik, L., Bauman, A., Redman, S, Milat, A., Schroeder, J., Cohen, G., Chapman, S. (2015). A mixed methods study of the factors that influence whether intervention research has policy and practice impacts: perceptions of Australian researchers. BMJ Open, 5(7), 1-13. <http://dx.doi.org/10.1136/bmjopen-2015-008153>



Importance of intervention research

Only 1 in 5 published studies are intervention research

3-8 % of intervention studies are 'effectiveness' or 'scalability'

RESEARCH ENTERPRISE

Indigenous health research: a critical review of outputs over time

Robert W Sanson-Fisher, Elizabeth M Campbell, Janice J Perkins, Steve V Blunden and Bob B Davis

Milat et al. *BMC Public Health* 2011, 11:834
<http://www.biomedcentral.com/11471-2458/11/834>



CORRESPONDENCE

Open Access

Public health research outputs from efficacy to dissemination: a bibliometric analysis

Andrew J Milat^{1,2*}, Adrian E Bauman², Sally Redman¹ and Nada Curac²

We Are What We Do Research Outputs of Public Health

Rob W. Sanson-Fisher, PhD, Elizabeth M. Campbell, PhD
Cynthia J. Millar, BSc

A description of public health research output and citation 523

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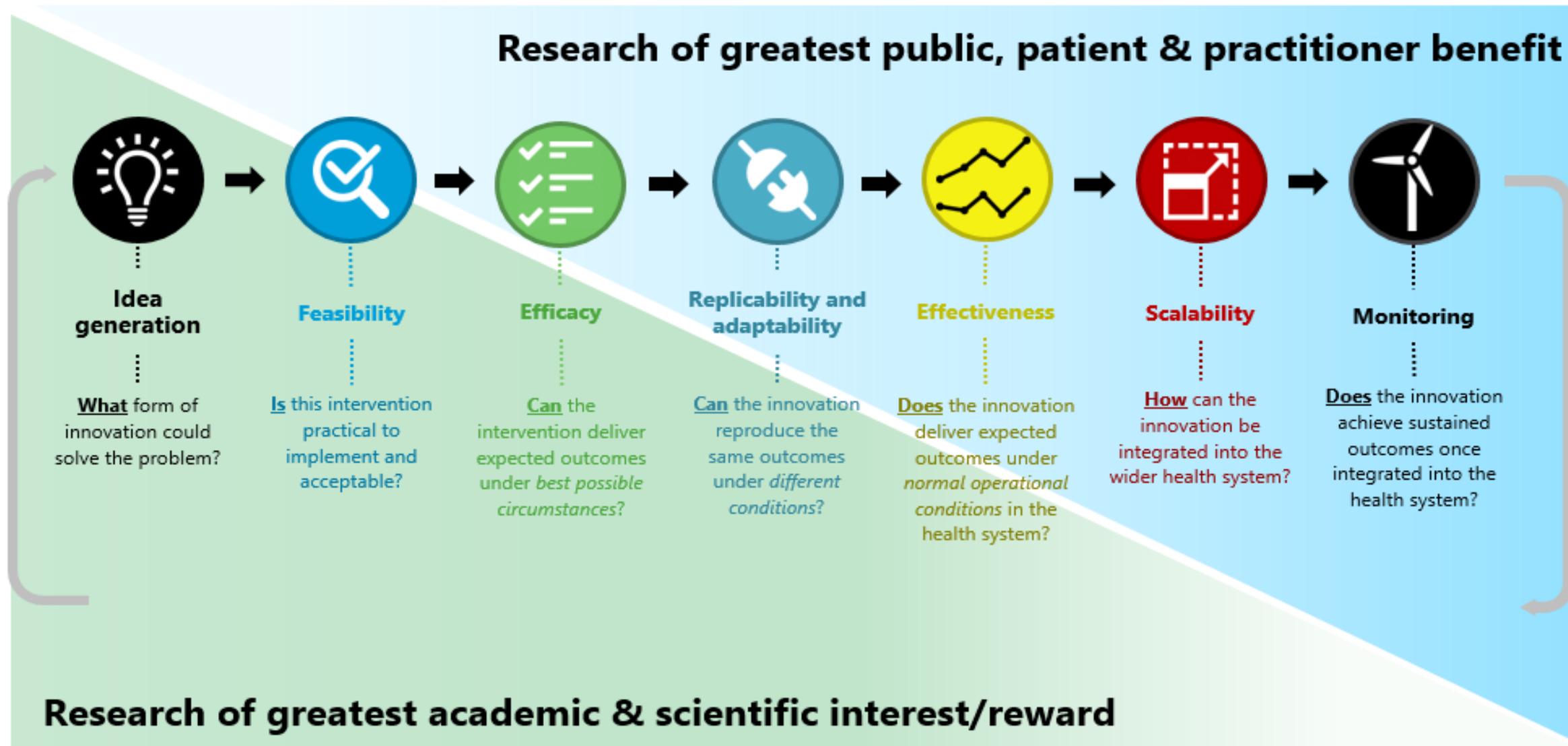
Short Report

What is generated and what is used: a description of public health research output and citation

Luke Wolfenden^{1,2,3}, Andrew J. Milat^{4,5}, Christophe Lecathelinais³, Rob W. Sanson-Fisher^{1,2}, Mariko L. Carey^{1,2}, Jamie Bryant^{1,2}, Amy Waller^{1,2}, John Wiggers^{1,2,3}, Tara Clinton-McHarg^{1,2}, Sze Lin Yoong^{1,2,3}

Translational research framework

Research of greatest public, patient & practitioner benefit



Research of greatest academic & scientific interest/reward

Increasing research influence

- Set research priorities and research questions that take in account of the **needs of end users**³
- Conduct research in **collaboration with end users**³
- Establish **‘implementation laboratories’** that encourages the systematic uptake of research findings and other evidence-based practices into routine practice⁴

³ Chalmers I, Bracken MB, Djulbegovic D, Garattini S, Grant J, Gulmezoglu AM, Howells DW, Ioannidis JP, Oliver S. Research: increasing value, reducing waste: low to increase value and reduce waste when research priorities are set. *Lancet* 2014; 383: 156-165.

⁴ Ivers NM, Grimshaw JM. Reducing research waste with implementation laboratories. *Lancet* 2016; 388(10044); 547-8.



Available online at www.sciencedirect.com

Public Health

journal homepage: www.elsevier.com/puhe



Original Research

The correlation between National Health Service trusts' clinical trial activity and both mortality rates and care quality commission ratings: a retrospective cross-sectional study



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Clinical
Epidemiology

COMMENTARIES

Embedding researchers in health service organizations improves research translation and health service performance: the Australian Hunter New England Population Health example

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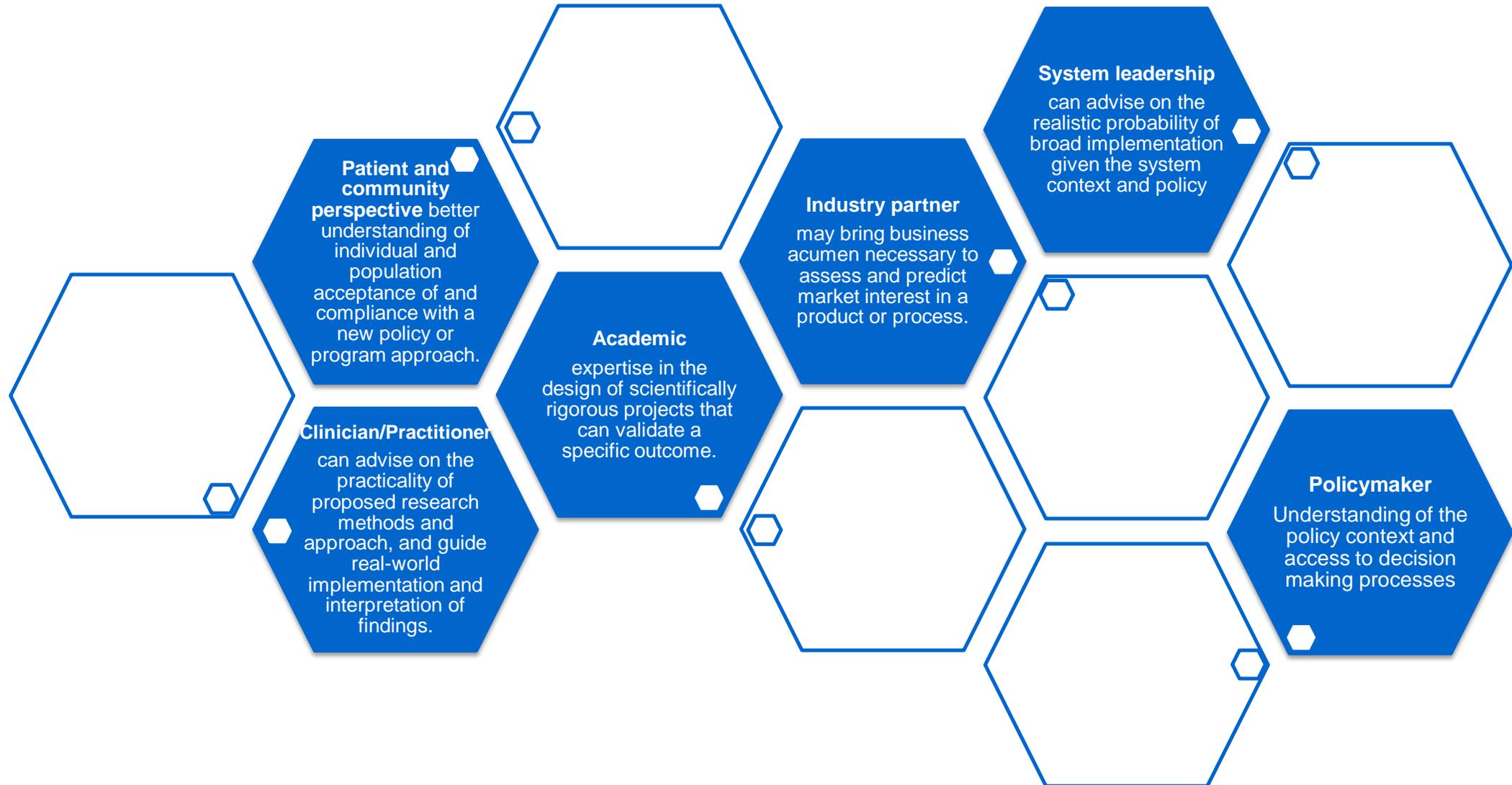
^bHunter Medical Research Institute, Lot 1 Kookaburra Circuit, New Lambton Heights, New South Wales, 2305, Australia

^cHunter New England Population Health, Hunter New England Local Health District, Booth Building, Wallsend Health Services, Longworth Avenue, Wallsend, New South Wales 2287, Australia

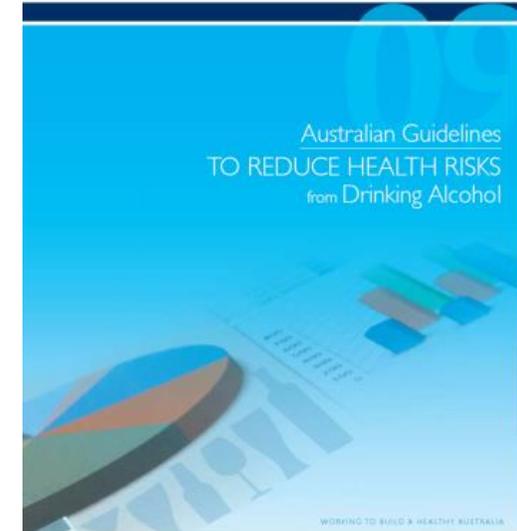
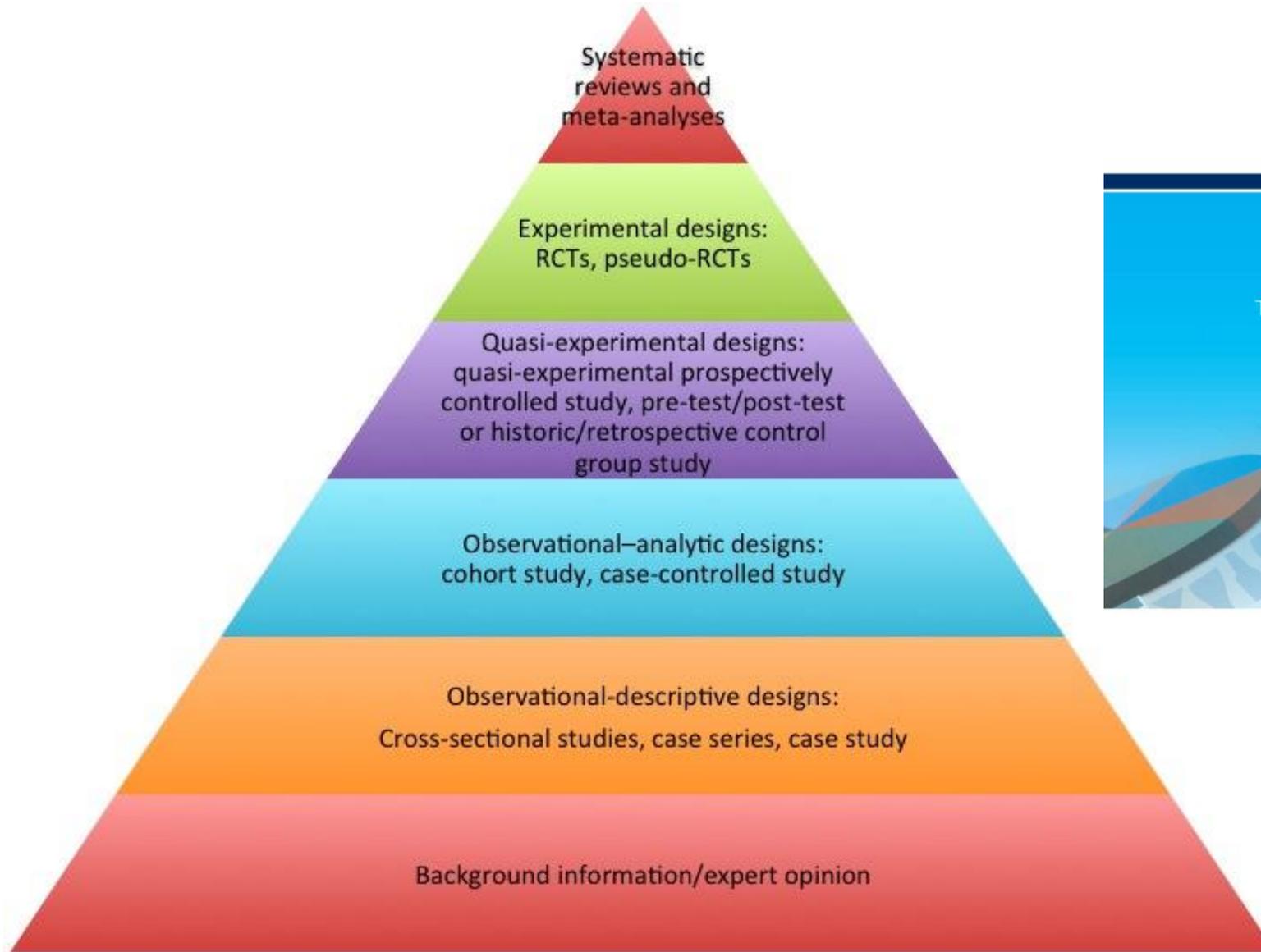
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Different perspectives and strengths

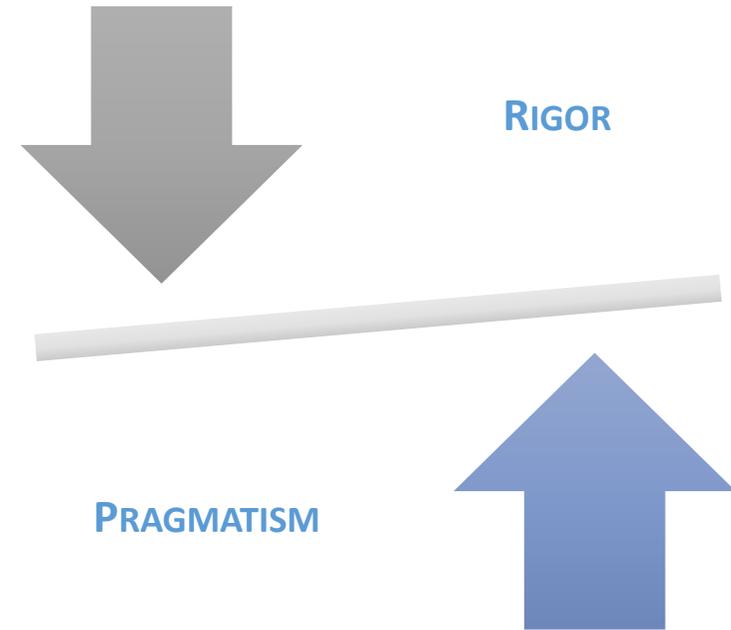


Evidence hierarchy



Why is the right study design so important?

- Health **interventions are often multifactorial** to effectively target the complexity of health and health behaviour
- A well-planned and executed study design is critical to the overall **credibility and utility** of the intervention research
- The design should balance **rigor and pragmatism** in a real-world context



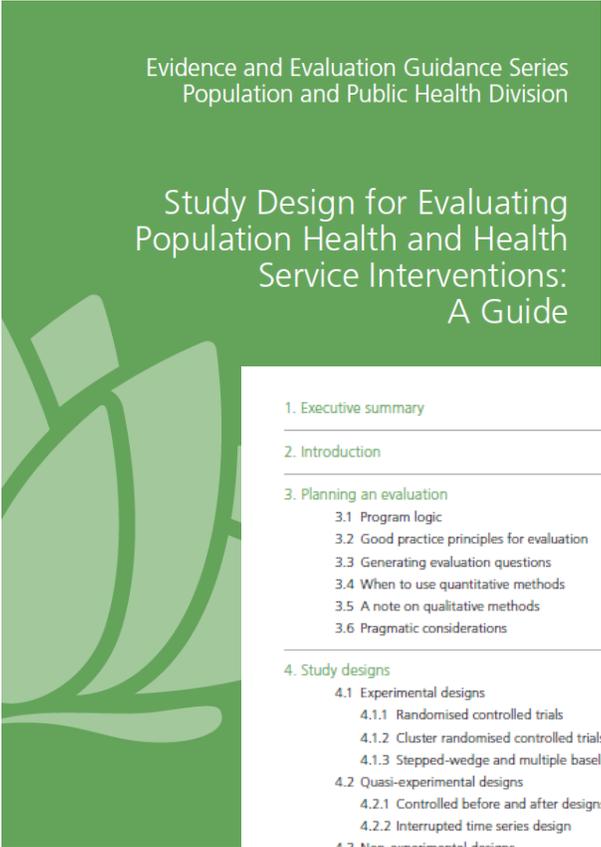
Selecting the right design

- Study design **must be fit for purpose**
- Pragmatic considerations:
 - Research question
 - Nature of the intervention
 - Stage of the intervention development and implementation
 - Likelihood of bias
 - Availability of data
 - Feasibility of data collection
 - Acceptability (subjects and stakeholders)
 - Strategic context
 - Integrity of the study design, and
 - Availability of resources, including costs, time and sample size required.
- Experimental designs provide the strongest evidence of causality
- Quasi-experimental and observational designs can offer a pragmatic alternative



Study Design for Evaluating Population Health and Health Services Interventions: A Guide

- ▶ Assist NSW Health staff in the planning and designing of research and evaluation
- ▶ Considers the quality and credibility of different designs, as well as pragmatic considerations
- ▶ Part of a larger strategy to build evaluation capability and data literacy across NSW Health



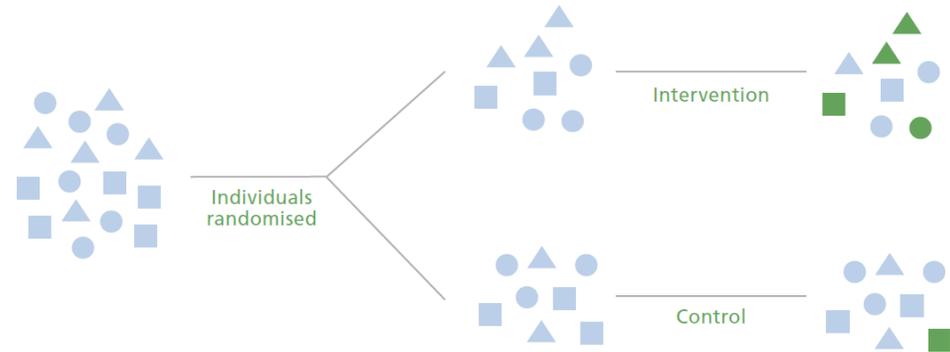
Evidence and Evaluation Guidance Series
Population and Public Health Division

Study Design for Evaluating
Population Health and Health
Service Interventions:
A Guide

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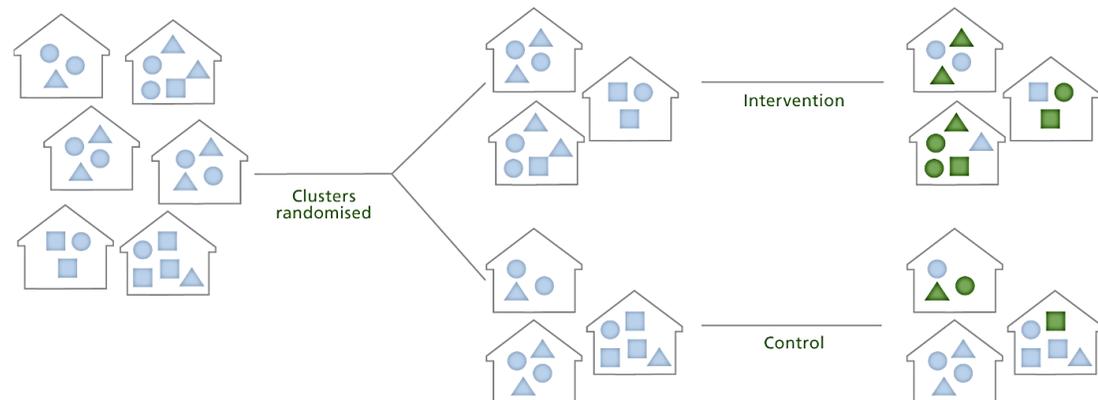
Experimental: RCTs vs Cluster RCT

- Randomisation occurs at the individual-level



Note: Green shapes represent individuals with a change in the outcome of interest at follow up

- Randomisation occurs at the group-level
- Groups (clusters) are randomly allocated to control or intervention rather than individuals



Note: Green shapes represent individuals with a change in the outcome of interest at follow up

Other useful resources

Guidance Series

- Program Logic
 - Study Design
 - Increasing the Scale of Population Health Interventions
 - Assessing the Scalability of Health Interventions
 - Commissioning Evaluation Services
 - Commissioning Economic Evaluations
 - Setting Research Priorities
- **Translational Research Framework and Source Book**



<http://www.health.nsw.gov.au/ohmr/Documents/trgs-round2-translational-research-framework.pdf>



<http://www.health.nsw.gov.au/ohmr/Documents/research-framework-sourcebook.pdf>



<https://www.health.nsw.gov.au/research/Pages/population-health-guidance-series.aspx>

Analytics Assist: Data and analysis one-stop-shop



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Advice

Analytics Assist has a range of advisory services to provide guidance to NSW Health staff using statewide data.

Our small team of experienced analysts can help you reach your analytic objectives by providing advice on the data, the team and the approach needed to answer the questions at hand. Submit a request by clicking the 'Ask us now' button below.



Ways that we can help



Support to self serve

We can help you to find the data and information that you need on our



Advisory service

We can provide guidance on which data and analysis methods are right



Referral service

We can connect you with key people and help set up the team and

Your Feedback



Analytics Assist: Data and analysis one-stop-shop

The screenshot shows the NSW Health website interface. At the top left is the NSW Government logo and the word "Health". A navigation bar contains links for "Home", "Directory Assistance", "Health Internet Site", and "Search". An "Internal Search" input field is located at the top right. The left sidebar lists various categories: "About NSW Health", "Division & Branches", "Rural Health", "Events & Conferences", "Data & Information", "Employment", "A-Z Health Topics", and "Related Agencies". Below these are icons for "NDIS", "HealthStats", "Analytics Assist" (circled in yellow), "Aboriginal Health", "Impact Statement", "PROCUREMENT PORTAL", "Between the Flags", "ONLINE LEARNING CENTRE", "Concerns about your health care", "EXCELLENCE IN NURSING & MIDWIFERY AWARDS", "WHOLE OF HEALTH PROGRAM", and "Excellence and". The main content area features a "NSW bushfires" section with text about bushfire impacts and a "Public information" section with a link to a bushfire landing page. Below this is a "What's New" section with a list of recent news items. The right sidebar contains several utility links: "Work Support Centre", "Policy Directives, Guidelines & Information Bulletins", "Publications", "Health Services", "EMS Information Centre", "Human Resources E-Compendium", "LEGAL COMPENDIUM", "BRIAN TUTT LIBRARY AND RESOURCE CENTRE", "NSW Health Intranets", "Value based healthcare", "EmploymentPortal", "It starts with ME Together WE can make a difference", and "iCanQuit".