Translational research, research methods and data analytics

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NSW GOVERNMENT Health

Role of research in healthcare and public health

- 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]

REWARD
REduce research Waste
And Reward Diligence

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 Science20127:50 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

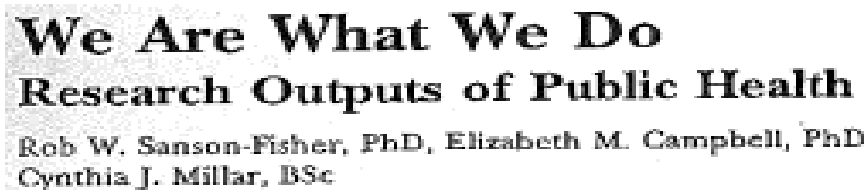
Only 1 in 5 published studies are intervention research

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



We Are What We Do

Research Outputs of Public Health

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

Milat et al. BMC Public Health 2011, 11:934

BMC Public Heal

CORRESPONDENCE Open Acce

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

Andrew J Milat[1,3*], Adrian E Bauman[2], Sally Redman[1] and Nada Curac[3]

A description of public health research output and citation 523

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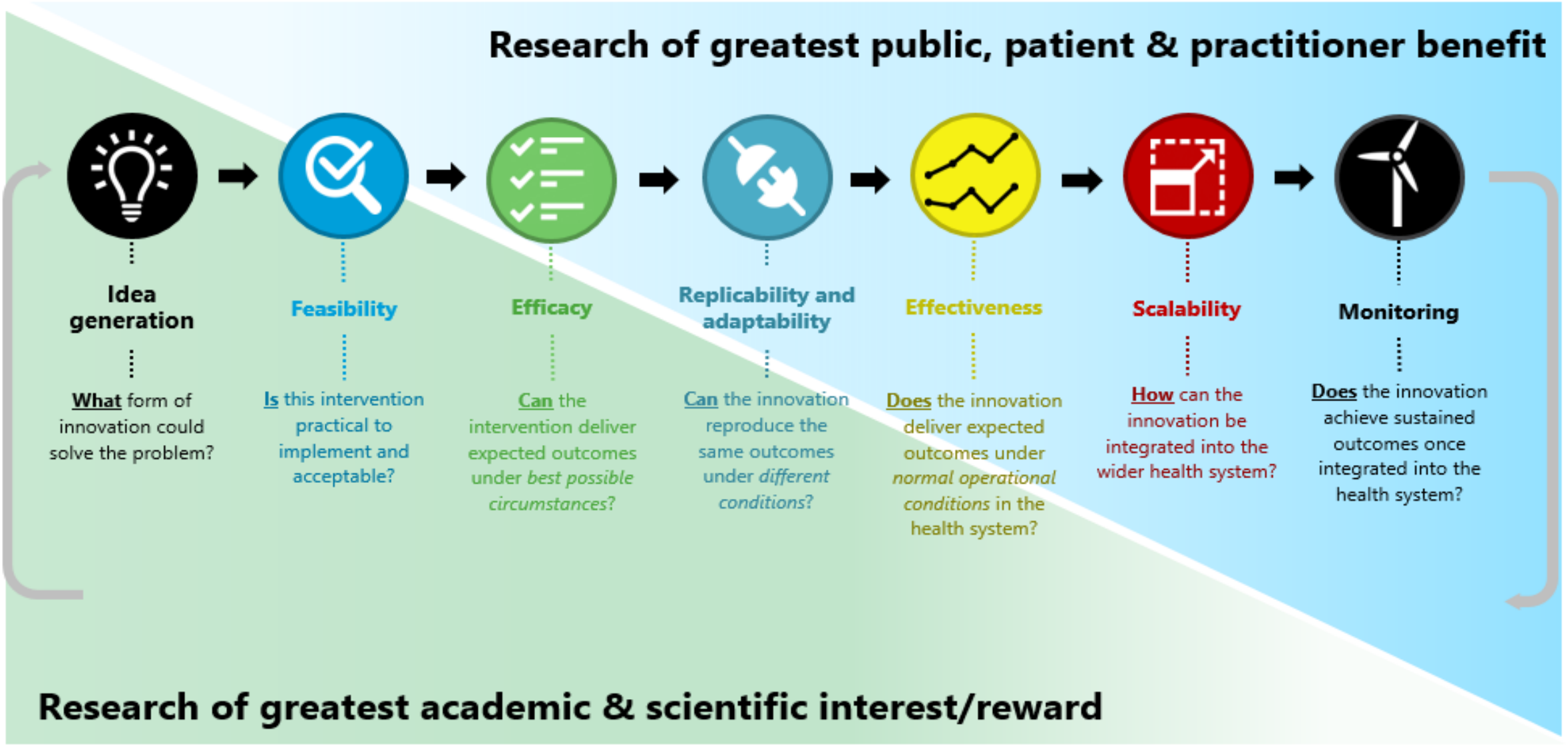
doi:10.1093/eurpub/ckw047 Advance Access published on 9 April 2016

Short Report

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

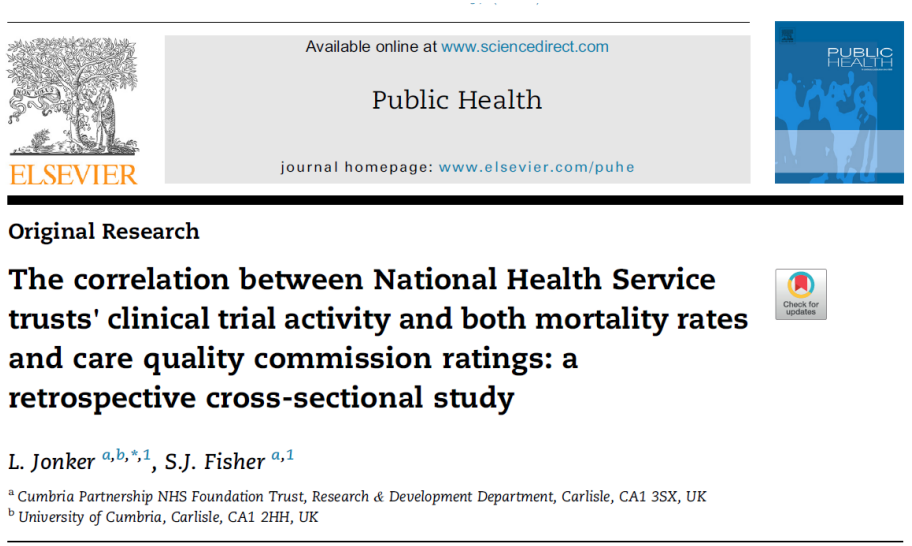
Luke Wolfenden[1,2,3], Andrew J. Milat[4,5], Christophe Lecathelinais[3], Rob W. Sanson-Fisher[1,2], Mariko L. Carey[1,2], Jamie Bryant[1,2], Amy Waller[1,2], John Wiggers[1,2,3], Tara Clinton-McHarg[1,2], Sze Lin Yoong[1,2,3]

Translational research framework



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 practice[4]



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

L. Jonker [a,b,*,1], *S.J. Fisher* [a,1]

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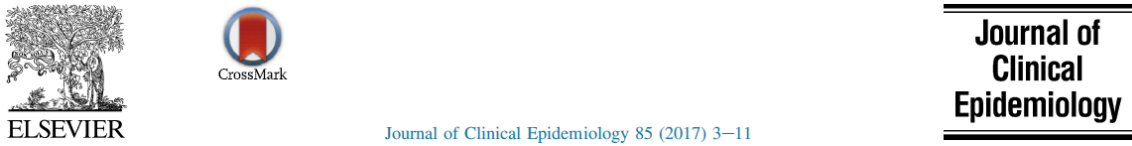
[b] *University of Cumbria, Carlisle, CA1 2HH, UK*



Journal of Clinical Epidemiology 85 (2017) 3–11

Journal of Clinical Epidemiology

COMMENTARIES

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

Luke Wolfenden[a,b,c,*], Sze Lin Yoong[a,b,c], Christopher M. Williams[a,b,c], Jeremy Grimshaw[d], David N. Durrheim[a,b,c], Karen Gillham[a,b,c], John Wiggers[a,b,c]

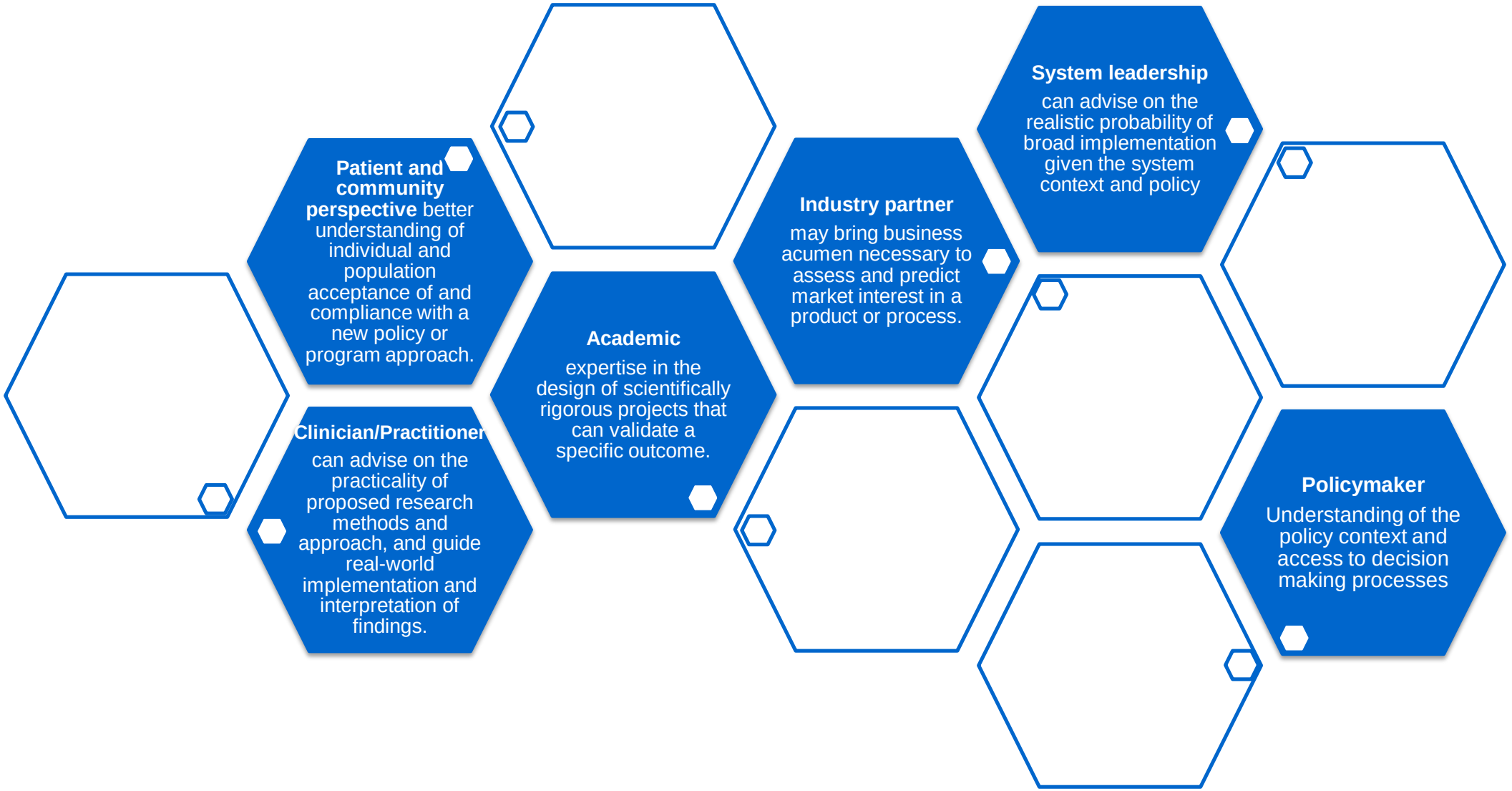
[a] *School of Medicine and Public Health, The University of Newcastle, University Drive, Callaghan, New South Wales, 2308, Australia*
[b] *Hunter Medical Research Institute, Lot 1 Kookaburra Circuit, New Lambton Heights, New South Wales, 2305, Australia*
[c] *Hunter New England Population Health, Hunter New England Local Health District, Booth Building, Wallsend Health Services, Longworth Avenue, Wallsend, New South Wales 2287, Australia*
[d] *Ottawa Hospital Research Institute, Ottawa General Hospital, 501 Smyth Road, Ottawa, ON K1H 8L6, Canada*

Accepted 14 March 2017; Published online 21 March 2017

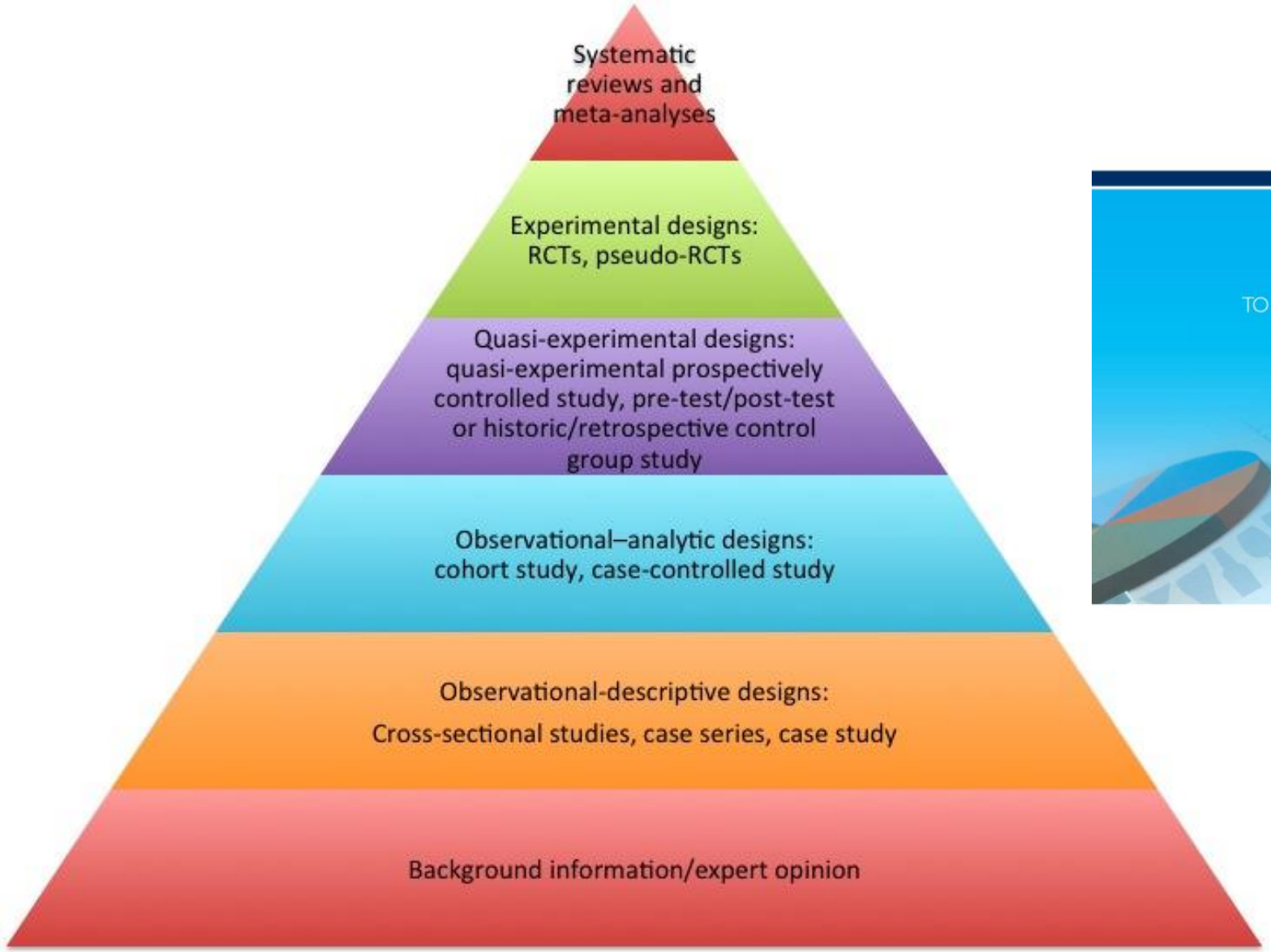
[3] Chalmers I, Bracken MB, Djulbegovic D, Garattini S, Grant J, Gulmezoglu AM, Howells DW, Ioannidis JP, Oliver S. Research: increasing value, reducing waste: low to increase value and reduce waste when research priorities are set. *Lancet* 2014; 383: 156-165.

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

Different perspectives and strengths

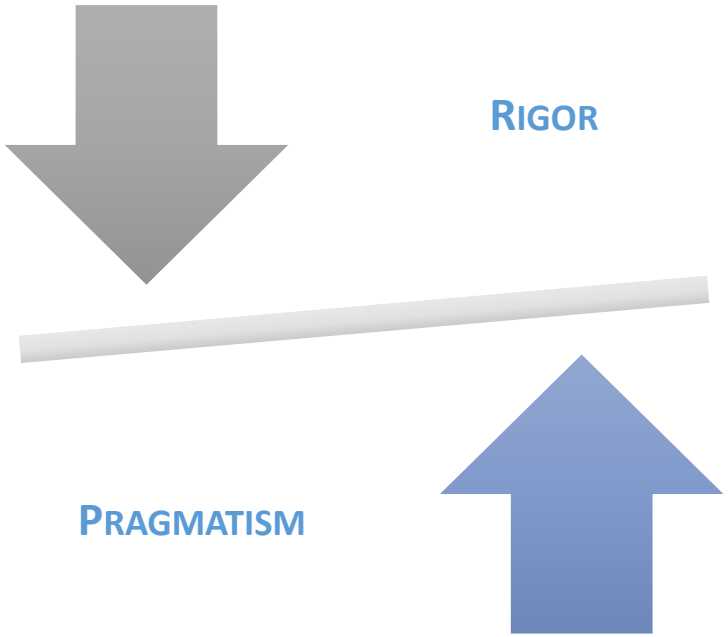


Evidence hierarchy



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

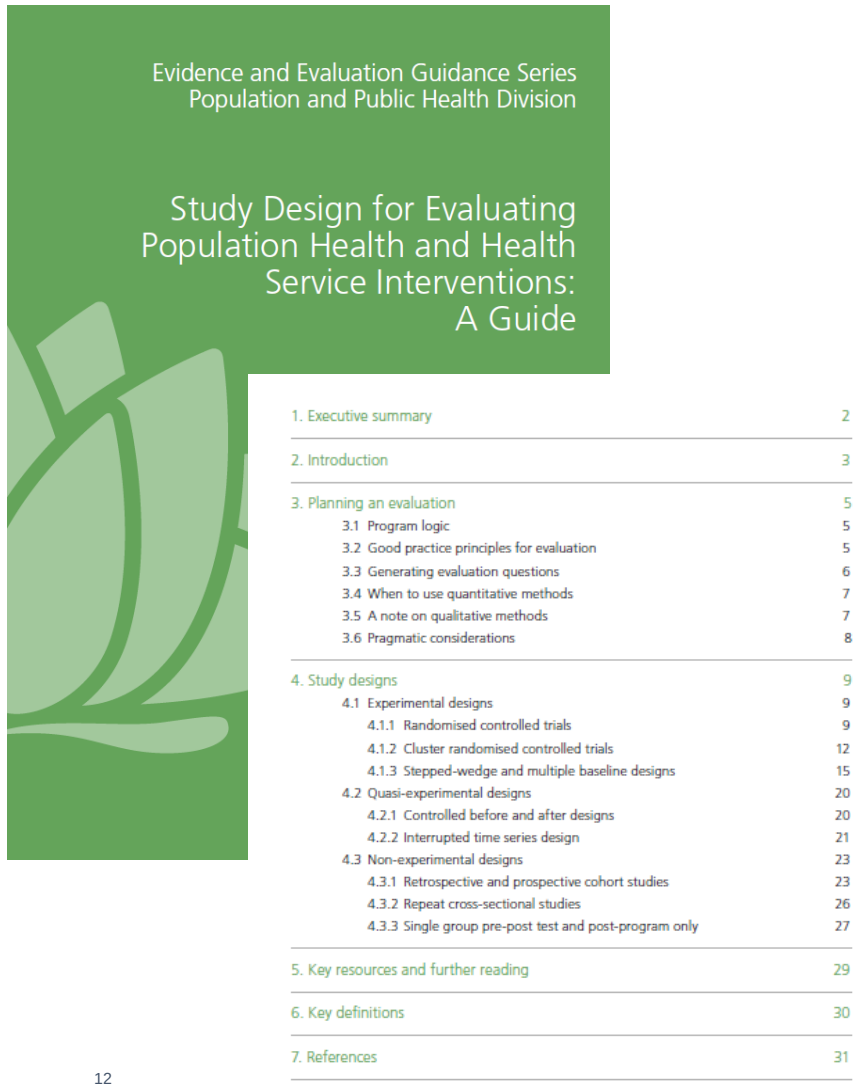


Selecting the right design

- 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

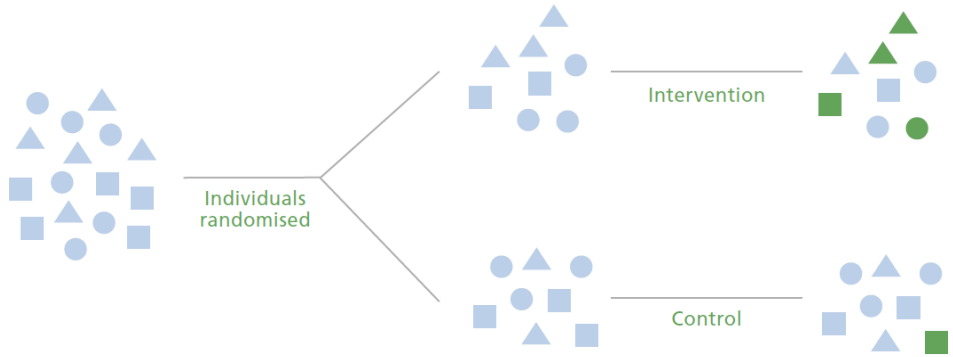
Study Design for Evaluating Population Health and Health Services Interventions: A Guide

- 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



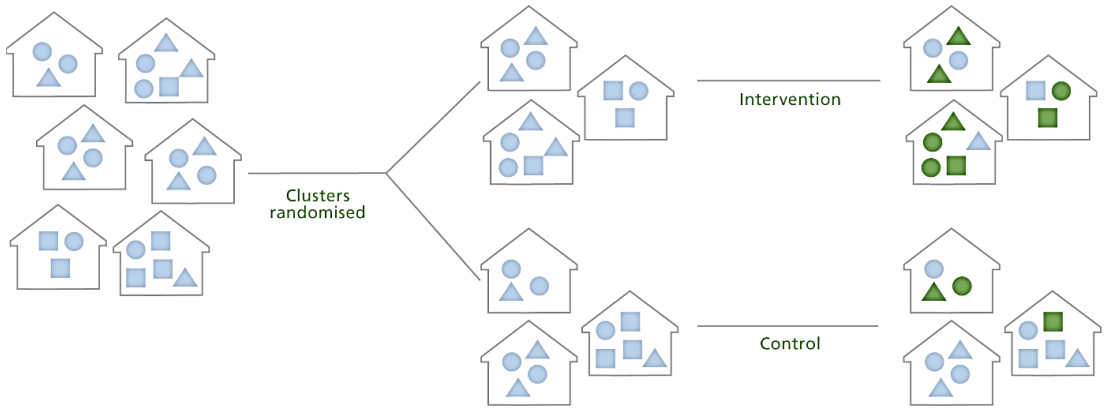
Experimental: RCTs vs Cluster RCT

- 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

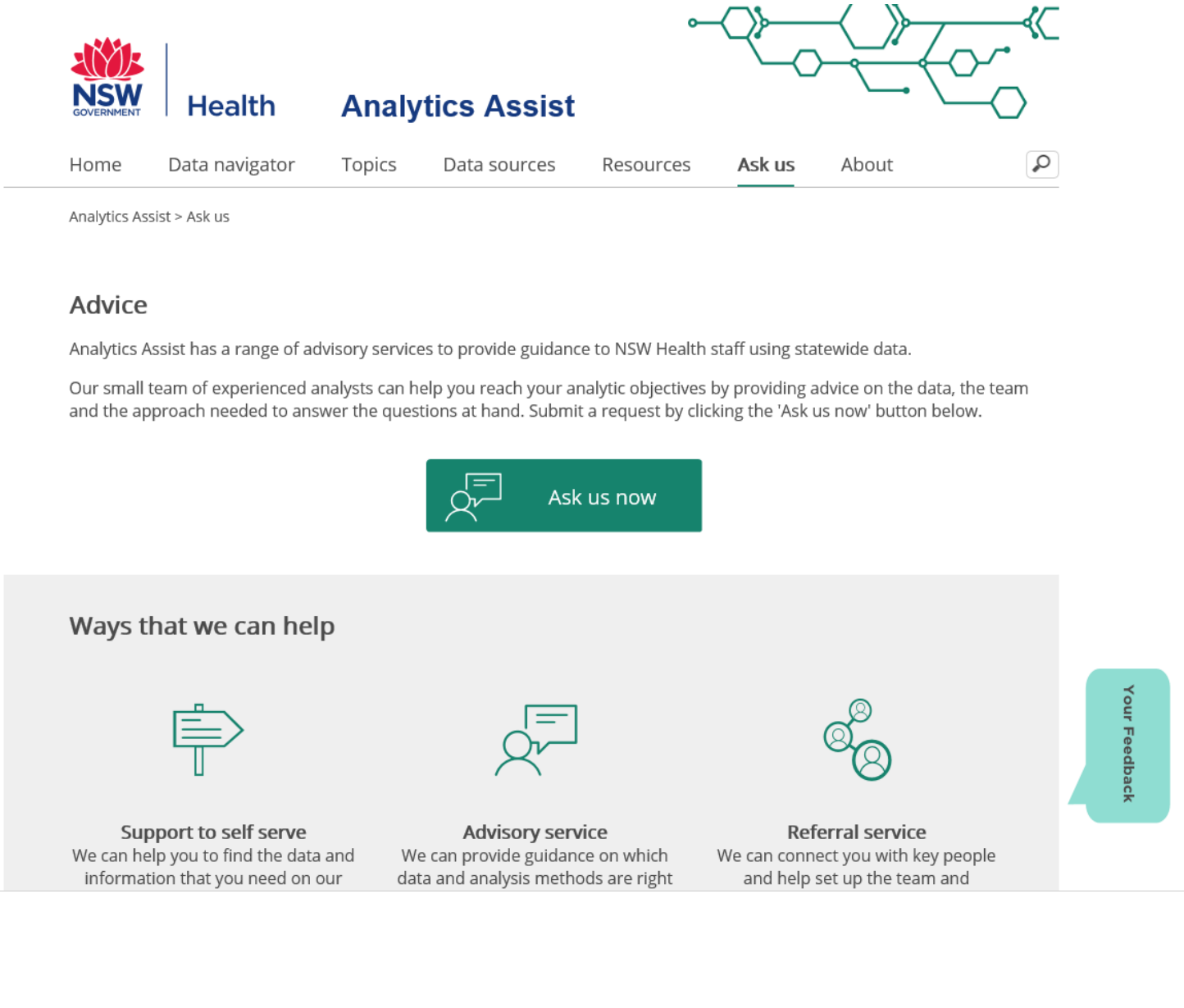
https://www.health.nsw.gov.au/research/Pages/population-health-guidance-series.aspx

- **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

Analytics Assist: Data and analysis one-stop-shop



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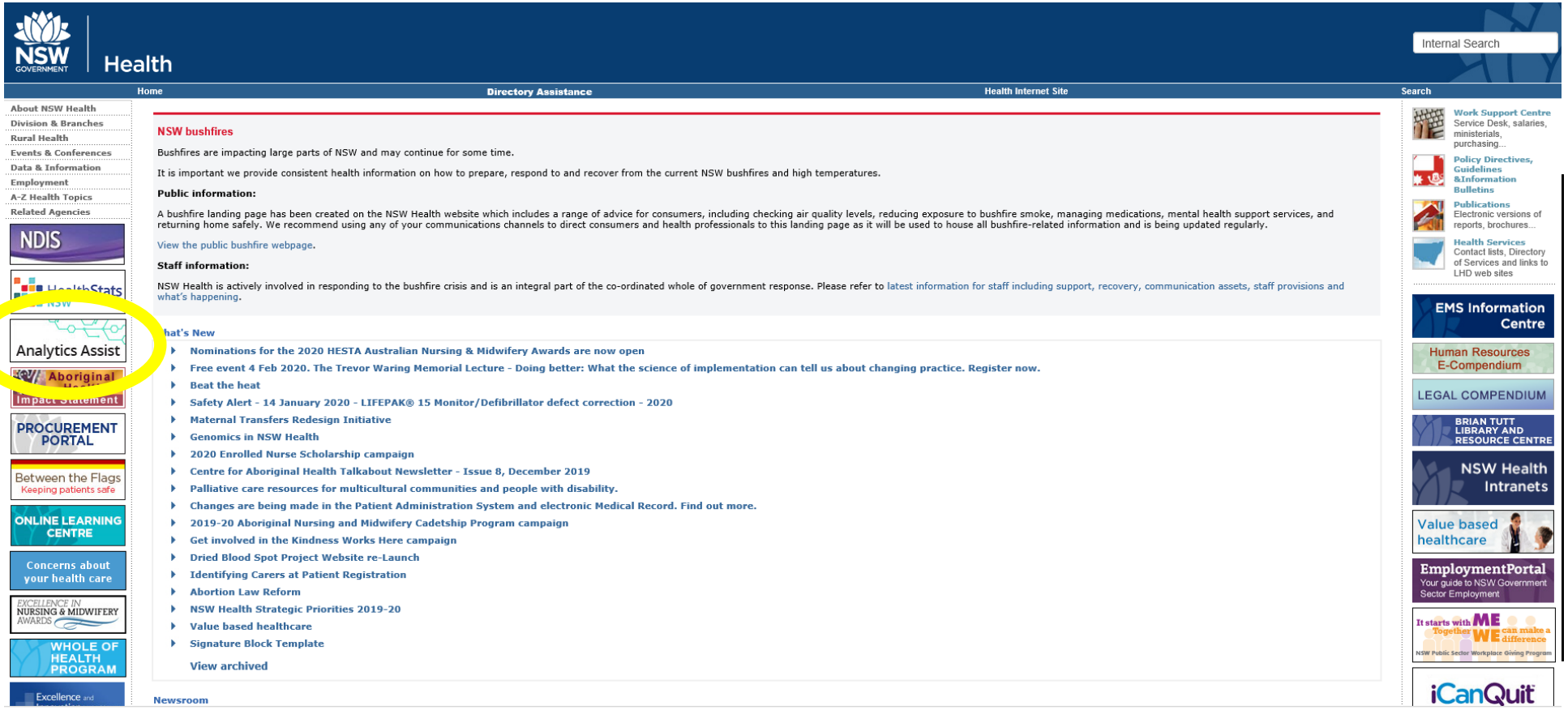

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