Translational research, research methods and data analytics

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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.
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 \(^2\)

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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)
Importance of intervention research

Only 1 in 5 published studies are intervention research

3-8% of intervention studies are ‘effectiveness’ or ‘scalability’
Translational research framework

Research of greatest public, patient & practitioner benefit

Idea generation
- What form of innovation could solve the problem?

Feasibility
- Is this intervention practical to implement and acceptable?

Efficacy
- Can the intervention deliver expected outcomes under best possible circumstances?

Replicability and adaptability
- Can the innovation reproduce the same outcomes under different conditions?

Effectiveness
- Does the innovation deliver expected outcomes under normal operational conditions in the health system?

Scalability
- How can the innovation be integrated into the wider health system?

Monitoring
- Does the innovation achieve sustained outcomes once integrated into the health system?

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 practice\(^4\)

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\(^3\) 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.

Different perspectives and strengths

*Clinician/Practitioner* can advise on the practicality of proposed research methods and approach, and guide real-world implementation and interpretation of findings.

*Academic* expertise in the design of scientifically rigorous projects that can validate a specific outcome.

*Patient and community perspective* better understanding of individual and population acceptance of and compliance with a new policy or program approach.

*System leadership* can advise on the realistic probability of broad implementation given the system context and policy.

*Industry partner* may bring business acumen necessary to assess and predict market interest in a product or process.

*System leadership* can advise on the realistic probability of broad implementation given the system context and policy.

*Policymaker* Understanding of the policy context and access to decision making processes.
Evidence hierarchy

- Systematic reviews and meta-analyses
- Experimental designs: RCTs, pseudo-RCTs
- Quasi-experimental designs: quasi-experimental prospectively controlled study, pre-test/post-test or historic/reportspective control group study
- Observational-analytic designs: cohort study, case-controlled study
- Observational-descriptive designs: Cross-sectional studies, case series, case study
- Background information/expert opinion
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

- Randomisation occurs at the group-level

- Groups (clusters) are randomly allocated to control or intervention rather than individuals
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


Analytics Assist: Data and analysis one-stop-shop

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 site.
- **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 project.
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