An introduction to research impact assessment: Why, what and how?
Our part of the world...
DEMONSTRATING/ACKNOWLEDGING EXISTING RESEARCH TRANSLATION AND IMPACT

&

ENCOURAGING RESEARCH TRANSLATION AND IMPACT
Experience to date
(research impact assessment)

- Research hub – Draft HMRI FAIT
- Pilots – Philanthropic investments
- DIIS project – Extend to Australian MRIs
- Prospective application to two NHMRC CREs
  - CRE Indigenous Quality Improvement
  - CRE in Stroke Rehabilitation
- Retrospective application to health service research:
  - HNELHD Pop Health unit
- Range of methods; numerous current initiatives
Agenda

• Why and what?
  – Definitions & acronyms
  – Historical context
  – Why? Really why?
  – Criticisms, attitudes, barriers and challenges for assessing impact
  – Questions?

• Examples: ARC EIA & HMRI FAIT
  – How? Introductory version

• Summary

• How to conduct RIA? Basic introduction to one approach
Key acronyms & definitions
(Examples, not definitive)
Key definitions (examples, not definitive)

Research impact assessment frameworks (RIAFs)
• Conceptual framework and accompanying guidance re methods and content

Measurement v Assessment
• Not a definition issue, but clear distinction
• Not definitive in usage nor this ppt

Metrics v Indicators
• Both related to measurement, but indicators typically ‘counts’ or Yes/No, whereas metrics could be ordinal, ratios
• General preference for ‘indicators’ at present
Key definitions (examples, not definitive)

Research translation
... a process of knowledge generation and transfer that enables those utilising the developed knowledge to apply it. This definition acknowledges that, once generated, knowledge flows can be multidirectional and non-sequential. (HMRI initial)

Research impact
... the demonstrable effect from the flows of knowledge between basic, patient and population-orientated research, and clinical trials, that improves human health and quality of life, and generates benefits for the economy, society, culture, national security, public policy, or the environment i.e. a societal perspective (HMRI initial)
Key definitions (examples, not definitive)

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Research (final?) impact

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Key definitions (examples, not definitive)

**Engagement**
- The interaction between researchers and research end-users outside of academia, for the mutually beneficial transfer of knowledge, technologies, methods or resources (ARC)

**End-users**
- An individual, community or organisation external to academia that will directly use or directly benefit from the output, outcome or result of the research (ARC)

**Unit of Analysis**
- A unit of analysis is the most basic element of a scientific research project (SAGE Social science methods)
Key definitions (examples, not definitive)

Outputs
• Products produced as a result of the research i.e. publications, conference presentations, changes to curriculum; patents

Outcomes
• Outputs must be utilised to become an outcome; metric must reflect utilisation
• Examples:
  – Many worthless patents; utilisation often reflected in IP value; implication – early disclosures more relevant as an output metric
  – Ideal world: Research references in policy change/clinical guideline change
Session 1:
Why measure impact?
Background... focus on impact/translation increasing

- 'Knowledge translation' defined by Canadian Institutes for Health Research
- US NIH National Center for Advancing Translational Research
- US NIH Clinical & Translational Science Awards / Institutes
- Excellence in Research Australia
- ARC Translational principles
- The Lancet (Research: increasing value, reducing waste)
- The Lancet (Chalmers & Glasziou)
- Payback Model (Buxton & Hanney)
- UK NIHR Translational Research Programmes (£775m.)
- Abbot:Hockey Budget (Reduced support to State health)
- Cancer Institute - measures of research impact
- NHMRC AHRTCs (Round 1)
- ARC Engagement & Impact Assess
- NHMRC - AHRTCs / CIRHs - Round 2
- Mckeon Review
- Chief Scientist (Prof. Chubb) - Keynote speech translational research
- NBCF - Commission Payback evaluation (MJA)
- MRFF Act 2015
Rush to.. So how do we measure impact?
First, stop to ‘really’ question why?
What exactly is the purpose?
Why measure impact?

- Health-economic imperatives:
  1. Budget pressure: Justify research expenditure
Why measure impact?

• Health-economic imperatives:
  1. Budget pressure: Justify research expenditure
  2. Productivity issues for MHR (*McKeon, MRFF*)
     A. Efficiency: Innovation to improve health outcomes / identify low value care
Why measure impact?

- ↑ Health exp. slowing, but as % of GDP still ↑

Health expenditure, % of GDP

Source: AIHW
• Health-economic imperatives:
  1. Budget pressure: Justify MHR
  2. Productivity issues for MHR (McKeon, MRFF)
     A. Efficiency: Innovation to improve health outcomes / identify low value care
     B. Growth: Optimise commercial innovations
Why measure impact?

Firms collaborating on innovation with higher education / PRIs, by firm size, 2008-10
% of product/process innovative firms in each size category

Source: OECD
Why measure impact?

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     A. Efficiency: Innovation to improve health outcomes / identify low value care
     B. Growth: Optimise commercial innovations
  3. Encourage high value, low waste research:
     Embed translation & impact
     (Chalmers, Glasziou, Grimshaw, Ioannidis et al)
Health-economic imperatives:

1. Budget pressure: Justify MHR
2. Productivity issues for MHR (McKeon, MRFF)
   A. Efficiency: Innovation to improve health outcomes / identify low value care
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3. Encourage high value, low waste research: Embed translation & impact
   (Chalmers, Glasziou, Grimshaw, Ioannidis et al)
Why measure impact?

• Traditional academic impact factors:
  – Grants
  – Publications
  – Journal impact factors
  – Conferences
  – RHD students
• Very limited for addressing these challenges
• Numerous impact frameworks developed
• Literature review – Only a few specify clear ‘purpose’
Will impact assessment frameworks realise these goals?

From the literature:

• Identified objectives grouped into eight (8) categories:
  – Top-down Accountability
  – Transparency / Bottom-up Accountability
  – Advocacy
  – Steering
  – Value for money
  – Management / Learning & Feedback / Fund allocation
  – (Measuring/improving the) Speed of translation
  – Prospective orientation of research

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<th>Accountability – Top Down</th>
<th>Transparency/Accountability – Bottom-Up</th>
<th>Advocacy</th>
<th>Steering</th>
<th>Value for Money</th>
<th>Management/Learning &amp; Feedback/Alloc.</th>
<th>Speed of Translation</th>
<th>Prospective Orientation</th>
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- Balanced Scorecard
- CAHS Impact Framework
- CIHR Impact Framework
- Comprehensive Research Metrics Logic
- Decision Making Impact Model
- Economic Impact Assessment (EIA)
- Excellence in Research for Australia (ERA)
- Health Services Research Impact Framework
- HMRI FAIT
- ITHS KLM/WHO Model
- Lean/Six-Sigma Models
- Matrix Scoring System
- NHMRC MORIA
- Payback Model
- Process Marker Model
- RE-AIM Model
- Research Engagement for Australia
- Research Excellence Framework
- Research Impact Framework
- Research Performance Evaluation
- Research Utilization Ladder
- Societal Impact Framework
- Telethon Kids Institute RIF
- Transl. Research Organiz. Perf. Model
- Weiss Logic Model
Summary & implications

- Surprisingly few RIAFs focus on the ‘purpose’ of assessment
- Hegemony of the 4As – Accountability, Advocacy, Analysis & Allocation
  - Proliferated by RAND
  - International School of impact assessment
- Methods
  - Case studies / Narratives
  - Metrics
  - Economic assessment
- Different strengths and weaknesses
Questions?
CRITICISMS, ATTITUDES, BARRIERS AND CHALLENGES FOR ASSESSING IMPACT
Criticisms

• Never oranges v oranges, so why bother?
• What about discovery / basic science / blue-sky research?
  • Impact assessment not be relevant; potentially corrupting
  • Is basic science/T1 research functioning optimally?
  • Research waste criticisms suggest not
• Administrative burden
  • Grant application process – Significant resource burden
  • Why add another administrative obligation?
Barriers to implementation

- Competing incentives
  “What drives any research; it’s survival... It’s such a competitive environment. This is what is on top of their mind. Rightly or wrongly.”
  
  Researcher, MRI, 2016

- Time-lags; distance to final impact (not just basic science)
- Challenges - Attribution, causation, the counterfactual...
- Can Researchers game the system?
- Academic freedom / Serendipitous outcomes
- Administrative burden
Attitudes towards assessment of research translation / impact

- Supportive of assessment; supportive/cautious re measurement
- Measurement changes behaviour
- What to measure a critical, but vexed issue:
  - Not about the metrics, but implications for behaviour
  - Traditional model: publications, grants, PhDs…treadmill mechanism
- Objectives – Take some control; realise health impacts
- “I think it’s done poorly”; “It’s really tricky”
- Strong desire for consistent approach
Commercialisation
(swaps ‘health service’ and the points remain)

- General – Very supportive; role in translation acknowledged
- Extent commercialisation embedded varies widely
- Progress, but academia / commercialisation tension:
  - Successful technologies/industry trials → lost careers

  [Researcher focus; Value outcomes, not outputs]

- “..don't count patents …more interested in disclosures… commercialisation potential”

  [Leading indicators/Process metrics]
Commercialisation
(swaps ‘health service’ and the points remain)

• Address at beginning of research cycle
  “marketing IP that a company hasn’t been involved in generating is a very tough gig…cannot assess the risk”
  [Prospective orientation; Embed end-users]

• Focus upon outcomes and utilisation
  “commercially oriented system…should be a milestone driven funding system, that says, ‘If you achieve this then you get the next bit of funding.’”
  [Outputs to Outcomes]
Summary insight from qualitative research

• Issues raised by researchers less about methods and metrics
• More about the research activities that the measurement of research translation and impact may or may not incentivise
Questions?
ARC Engagement & Impact Assessment

- **Engagement** – Indicators; Indicator explanation statement; narrative
- **Impact** – Approach to impact statement; Impact statement (both narratives) (from 2018)
- Units of analysis (certain level Fields of Research)
- Problems: Impact & end-user definitions; UoA, FTE (no normalization) – oranges with oranges?
- Indicator principles – Good, general support, incl. behav. considerations
ARC Engagement & Impact Assessment

• What does/will the ARC EIA achieve?
  – Top-down accountability; advocacy – For higher educ. sector & indiv. instit.
  – Steering – Partially e.g. Indigenous Research UoA
  – Management / Feedback (limited allocation) – Hopefully encourages supporting mechanisms; insights into success/failure?
  – Limited for: Bottom-up accountability/transparency; value for money; prospective orientation; acceleration of the speed of translation

• Partly constrained by discipline breadth

• ARC view: Limited funding realising significant impact initiatives; same as UK NIHR view
ARC Engagement & Impact Assessment

• Suitable for Institutional-level analysis (UoA)
  – Typically retrospective
  – Medium to Long-term outlook
  – Bigger picture thinking; strategic planning & management

• Limitations:
  – Another admin burden for researchers with limited & indirect return
  – How does it help/motivate/guide researchers?
  – Has ARC EIA changed your approach to research? Did ERA?
  – How does it accelerate the speed of translation? (long loop via management)
EXAMPLE: HMRI FAIT Framework to Assess the Impact from Translational health research
Developed following mixed methods research

• **Scoping literature reviews**
  – Existing research impact assessment frameworks
  – Purpose of existing frameworks
  – Methods for impact assessment

• **Qualitative**
  – Interviews with stakeholders
  – Initially HUB focused
  – State & federal government views
  – Expanded to MRI's around Australia
  – Broader engagements - NHMRC, ARC, MRFF, Brunel University (Payback), Karolinska Institute, Kings College, University of Oxford, HRC of NZ, etc.

• **Pilots**
  – FAIT
HMRI Framework for Assessing the Impact from Translational health-research (FAIT)

- Metrics
- Economic analysis
- Case studies / Narratives
HMRI Framework for Assessing the Impact from Translational health-research (FAIT)

- Potential domains: Knowledge generation, Clinical Implementation, policy, economic, community; Other views of benefit: community, family, country...
- Introduced process metrics
HMRI Framework for Assessing the Impact from Translational health-research (FAIT)

SROI, CBA, CEA, prospective CEA, VOI

Metrics

Economic analysis

Case studies / Narratives
HMRI Framework for Assessing the Impact from Translational health-research (FAIT)

- Case studies; good for complex and lengthy translation pathways
- Narratives – Shorter, less formal method
- Explain serendipitous research outcomes
- Links metrics and economic assessment
- Places research in context
HMRI Framework for Assessing the Impact from Translational health-research (FAIT)

Logic map supports these methods
**Cost of this research** = resources used to obtain the above outcomes + the cost of using the research outcomes e.g. additional cost of clinical training

**Cost can be compared against benefit**
PROJECT:
Reducing unnecessary Emergency Department visits by residents of aged care facilities

DOMAINS OF BENEFIT

<table>
<thead>
<tr>
<th>Metric categories</th>
<th>Metric Types</th>
<th>Metric Value (as of 1 July 2015)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advance Knowledge</td>
<td>PRO completions, Datasets in repository, Publications</td>
<td>3 (per $1m funding)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 (per $1m funding)</td>
</tr>
<tr>
<td>Clinical Implementation</td>
<td>New clinical guidelines, Clinical trial outcomes, Aged care decision aid software</td>
<td>Protocols to reduce unnecessary Emergency Department (ED) presentations by residents of aged care facilities, reduces ED cohort presentations by 29% in 12 months, Software developed that guides aged care staff on streaming patients for clinical treatment.</td>
</tr>
<tr>
<td>Community Benefit</td>
<td>Improved quality of life (QoL) for aged care residents, Percentage point difference in QoL, compared to usual care where intervention is conducted</td>
<td>QoL: 19 percentage points higher in intervention aged care facilities</td>
</tr>
<tr>
<td>Legislation &amp; Policy</td>
<td>Citations in policy documents</td>
<td>1 – Aged care guidelines for resident care, 1 – Referenced by Federal government guidelines for aged care facilities</td>
</tr>
<tr>
<td>Economic Impact</td>
<td>Costs avoided in health system</td>
<td>Test region: based on opportunity cost, $230,000 p.a. in cost avoided calculation based on reduction in unnecessary ED presentations</td>
</tr>
</tbody>
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ECONOMIC ASSESSMENT – SOCIAL RETURN ON INVESTMENT

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<tr>
<th>Metric categories</th>
<th>Metric Types</th>
<th>Metric Values</th>
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<tr>
<td>Cost of research</td>
<td>2015 $</td>
<td>$75,000</td>
</tr>
<tr>
<td>Cost of using research</td>
<td>Outputs based on costs of additional clinical training (100k, discount)</td>
<td>$1.7 million</td>
</tr>
<tr>
<td>Benefit – Monetary values</td>
<td>Opportunity cost of costs avoided in EDs (100k, discount)</td>
<td>2.2:1 or $2.20 of benefit generated for every $1 of cost</td>
</tr>
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CASE STUDIES

Community need: In the absence of alternatives, staff from the aged care facilities are acting in a rational and conservative manner by sending unwell residents to Emergency Departments (ED). As a result, EDs receive many low acuity patients from aged care facilities who clinicians believe would be more appropriately treated in situ at their aged care facility. The unnecessary use of emergency facilities consumes resource-intensive hospital services and reduces the ED’s capacity to meet service quality (patient care) objectives in a sustainable and efficient manner.

Research response: Researchers designed an intervention program that combined intensive training of aged care staff with a purpose-designed software program that helped aged care staff guide patients into appropriate care pathways. The research was based upon the staff and residents within 20 aged care facilities with ten recruited to participate in the intervention and ten remaining in usual care.

Research outputs: The research process identified that many aged care staff were insufficiently computer literate to implement the system. Training was designed to address this issue. The staffs capability to make decisions that aligned with appropriate care for their residents was improved through the training software and guidelines.

Research impact: Measures of Quality of Life for the participating aged care residents were nine percentage points higher for those assessed through the new system. Actual costs (accounting measure) in the EDs did not decline because other patients’ requirements filled the void created. However, it is assumed that this will translate to benefits for the healthcare system in terms of higher service quality measures (patients serviced within appropriate thresholds) and/or reduced pressure upon rising ED budgets. Economists valued this benefit using opportunity cost.
Options for MARC impact assessment

- Distinction required re type of MHR:
  A. Traditional ‘knowledge development’; traditional university role; all float on the tide; threatened by protectionism i.e. commercialisation
  B. MHR that aspires to improve health outcomes; majority of MHR
    - IF LATTER > OPTIONS for RIA

1. Institutional-level impact assessment (MARC / CRE)
   - Suitable for: Top-down Accountability; Advocacy; and Management/Learning/Feedback
   - Assessment Lite: Minimise burden on researchers
   - Collect/Report moderate number of standardised metrics, narrative/case study examples

2. Accelerating Speed of Translation (AST) impact assessment
   - If this choice, carries additional implications (HMRI FAIT usually used in this context)
To summarise...
To summarise...

• Impact assessment is driven by economic imperatives that will not dissipate; may wax/wane, but will sustain

• Moral imperative to challenge whether optimising value of research investment; especially to improve health outcomes

• Assessment can shape research behaviour:
  o Maximise opportunity; mitigate perverse outcomes

• Preliminary question for MARC Impact Assessment:
  o What is the purpose?
  o Methods, content and scope follow from this decision
Questions?
Now to the question of...

How to conduct impact assessment?
Some key questions

1. What is the **demand** for the research?
2. What does the research **aim** to do? (and will this address demand?)
3. What is the **cost** of the research?
4. What **activities** will be undertaken?
5. What are the **outputs** from those activities?
6. Who will use the research **outputs** to produce **outcomes**?
7. What is the **cost** of utilisation?
8. If utilised, what **impacts** are expected?

*Plan for your impact analysis at start to improve data accuracy & cost of data collection*
Cost of this research = resources used to obtain the above outcomes + the cost of using the research outcomes e.g. additional cost of clinical training

Cost can be compared against benefit
Final comments...

- Paucity of high-quality evidence
  - Largely qualitative
  - Some observational studies
  - Difficult to establish quasi-experimental studies; progressing
- HMRI – Working to expand evidence base
- Publications:
THANK YOU

Contact: Simon.Deeming@hmri.org.au