Measuring (and encouraging) research impact in MRIs
Presentation to the Strategy Meeting, AAMRI Convention

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Agenda

- Experience to date
- Why measure impact?
- Review of existing Research Impact Frameworks (RIF)
- Attitudes, barriers & challenges to measuring impact
- Guiding principles for a RIF
- Example: HMRI FAIT
EXPERIENCE TO DATE
Experience ... measuring research impact

- **Need to measure research translation & impact 2013**
- **HMRI FAIT**
  - Background research: Qualitative interviews; Literature review
  - **Publication**
  - **IMPLEMENTATION CRE IQI**
  - **IMPLEMENTATION CRE Stroke Rehabilitation**
  - **IMPLEMENTATION NHEHLHD Pop Health**
  - **Publications**
  - **DIIS / DoH**
  - **AAMRI**
  - **Individual MRIs**
  - **NHMRC: HTAC / Symposium**
- **Measuring impact in MRIs (DIIS grant)**
WHY MEASURE IMPACT?
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- Health-economic imperatives:
  1. Budget pressure: Justify research expenditure
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  2. Productivity issues for MHR (*McKeon, MRFF*)
     - 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
Why measure impact?

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

HMRI is a partnership between the University of Newcastle, Hunter New England Local Health District and the Community.
• Health-economic imperatives:
  1. Budget pressure: Justify MHR
  2. Productivity issues for MHR (*McKeon, MRFF*)
     • Efficiency: Innovation to improve health outcomes / identify low value care
     • Growth: Optimise commercial innovations
  3. Encourage high value, low waste research:
     Embed translation & impact
     (*Chalmers, Glasziou, Grimshaw, Ioannidis et al*)
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

<table>
<thead>
<tr>
<th>Yes</th>
<th>Partial</th>
<th>No</th>
<th>Possible</th>
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<tbody>
<tr>
<td>BALANCED SCORECARD</td>
<td>CAHS IMPACT FRAMEWORK</td>
<td>CIHR IMPACT FRAMEWORK</td>
<td>COMPREHENSIVE RESEARCH METRICS LOGIC</td>
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<tr>
<td>DECISION MAKING IMPACT MODEL</td>
<td>ECONOMIC IMPACT ASSESSMENT (EIA)</td>
<td>EXCELLENCE IN RESEARCH FOR AUSTRALIA (ERA)</td>
<td>HEALTH SERVICES RESEARCH IMPACT F/WORK</td>
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<tr>
<td>HMRI FAIT</td>
<td>ITHS KLM/WHO MODEL</td>
<td>LEAN/SIX-SIGMA MODELS</td>
<td>MATRIX SCORING SYSTEM</td>
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<td>NHMRC MORIA</td>
<td>PAYBACK MODEL</td>
<td>PROCESS MARKER MODEL</td>
<td>RE-AIM MODEL</td>
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<tr>
<td>RESEARCH ENGAGEMENT FOR AUSTRALIA</td>
<td>RESEARCH EXCELLENCE FRAMEWORK</td>
<td>RESEARCH IMPACT FRAMEWORK</td>
<td>RESEARCH PERFORMANCE EVALUATION</td>
</tr>
<tr>
<td>RESEARCH UTILIZATION LADDER</td>
<td>SOCIETAL IMPACT FRAMEWORK</td>
<td>TELETHON KIDS INSTITUTE RIF</td>
<td>TRANSL. RESEARCH ORGANIZ. PERF. MODEL</td>
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<tr>
<td>WEISS LOGIC MODEL</td>
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ATTITUDES, BARRIERS AND CHALLENGES FOR MEASURING IMPACT
Participants: “Thank you”

- Baker IDI Heart and Diabetes
- Bionics Institute of Australia
- Burnet Institute
- George Institute for Global Health
- Kirby Institute, UNSW
- Mater Research/Translational Research Institute
- Menzies Research Institute Tasmania
- Murdoch Childrens Research Institute
- National Ageing Research Institute
- QIMR Berghofer
- Sax Institute
- SAHMRI
- Telethon Kids Institute Perth
- Walter & Eliza Hall Institute of Medical Research
- Woolcock Institute of Medical Research

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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
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 (basic science)

- Challenges - Attribution, causation, the counterfactual…

- Can Researchers game the system?

- Administrative burden

- Academic freedom / Serendipitous outcomes
Commercialisation

• 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

• 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]
GUIDING PRINCIPLES FOR IMPACT MEASUREMENT

(if primary objective to optimise translation & impact)
Guiding principles for impact measurement

- A focus upon researchers and the research process
Guiding principles for impact measurement

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- Prospective implementation/orientation
Guiding principles for impact measurement

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- Prospective implementation/orientation
- A line of sight to the main anticipated benefits
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• A logic model that embeds users and generates outcomes from outputs along the pathway
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• Align incentives for researchers/research programs with optimisation of the productive outcomes from their research
• An over-arching objective to enhance productivity by increasing probability of translation & impact across whole system
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- A focus upon researchers and the research process
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- A logic model that embeds users and generates outcomes from outputs along the pathway
- Align incentives for researchers/research programs with optimisation of the productive outcomes from their research
- An over-arching objective to enhance productivity by increasing probability of translation & impact across whole system
- Envisage a mechanism to enable researchers to optimise quality & impact
EXAMPLE: HMRI FAIT Framework to Assess the Impact from Translational health research
EXAMPLE: HMRI FAIT
FIG 1: Researcher focus; Prospective orientation

RESEARCH PROCESS – RETROSPECTIVE REVIEW

INCEPTION  APPLICATION  FUNDING  CONDUCT  OUTPUTS

OUTCOMES / INTERIM IMPACTS  FINAL IMPACTS

LESSONS LEARNT

MANAGEMENT / LEARNING & FEEDBACK / ALLOCATION

Source: Deeming et al 2016 (pending), Adaptation from Trochim et al 2011
EXAMPLE: HMRI FAIT

FIG 1: Researcher focus; Prospective orientation

RESEARCH PROCESS – RETROSPECTIVE REVIEW

INCEPTION → APPLICATION → FUNDING → CONDUCT → OUTPUTS

LESSONS LEARNT

OUTCOMES / INTERIM IMPACTS → FINAL IMPACTS

RESEARCH PROCESS – PROSPECTIVE ORIENTATION (Improved speed of translation)

INCEPTION → APPLICATION → FUNDING → CONDUCT → OUTPUTS

PROSPECTIVE ORIENTATION

OUTCOMES / INTERIM IMPACTS → FINAL IMPACTS

TRANSLATION & IMPACT PLAN:
- END-USERS
- EMBEDDED INTO RESEARCH
- IMPLEMENTATION PLAN
- LAB NOTE BOOKS, etc.

LESSONS LEARNT

MANAGEMENT / LEARNING & FEEDBACK / ALLOCATION

Source: Deeming et al 2016 (pending), Adaptation from Trochim et al 2011
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.
RIF METHODS

FIG 3: Metrics-based; complem. by narrative/economics

- **Metrics**
  - Actual data &/or ‘projected’ future values; SROI/CBA; CUA/CEA; VOI; Commercial market assess; Value for money

- **Case studies (narrative)**
  - Payback system; Becker List; HMRI databank
  - Links & explains metrics; good for complex/lengthy translation pathways; explains serendipitous research outcomes

- **Economic Assessment**
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 at 1 July 2015)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advance Knowledge</td>
<td>PhD 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</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 streamlining 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 9 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, $210,000 p.a., in cost avoided calculation based on reduction in unnecessary ED presentations</td>
</tr>
</tbody>
</table>

ECONOMIC ASSESSMENT – SOCIAL RETURN ON INVESTMENT

<table>
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<tr>
<th>Metric categories</th>
<th>Metric Types</th>
<th>Metric Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of research</td>
<td>2015 $</td>
<td>$575,000</td>
</tr>
<tr>
<td>Total cost of using research outputs:</td>
<td>$1.7 million</td>
<td></td>
</tr>
<tr>
<td>Benefit – Monetary value</td>
<td>Opportunity cost of costs avoided in EDs (12yrs, discount)</td>
<td>2.21 or $220 of benefit generated for every $1 of cost</td>
</tr>
</tbody>
</table>

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-site at the 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 staff’s 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 threshold) and/or reduced pressure upon rising ED budgets. Economist valued this benefit using opportunity cost.
RIF – MRI FACILITATION METRICS

FIG 5: Measures – Facilitation of translation & impact

FACILITATE: RESEARCH PROCESS

END-USER ENGAGEMENT; SERVICES: CTS/BIOSTATISTICS/HEALTH ECONOMICS/BIOINFORMATICS; KNOWLEDGE/RESEARCH TRANSLATION GUIDANCE; COMMERCIALISATION TEAM

SEED FUNDING, PROOF OF CONCEPT STUDIES, INDUSTRY ENGAGEMENT

LAB SPACE, EQUIPMENT, CLINICAL TRIAL SERVICES, COPRODUCTION

END-USER ENGAGEMENT, FUNDING TO DEV. COMMERCIAL IP, ACCESS TO COMMERCIALISATION TEAM

SERVICES: BIOSTATISTICS, H.E. etc.

PATIENT ENGAGEMENT & FEEDBACK SYSTEMS

INCEPTION → APPLICATION → FUNDING → CONDUCT → OUTPUTS → OUTCOMES / INTERIM IMPACTS → FINAL IMPACTS

FACILITATE: ENGAGEMENT & COLLABORATION

e.g. Industry/Govt./Health service engagement strategies; Coproduction facilitation; Clinician PhDs

FACILITATE: TRANSLATION & IMPACT CAPACITY

e.g. Health system data access; electronic IP lab notebooks, medical genomics platforms; health prof. research training
EXAMPLE: HMRI FAIT

- Project data readily aggregated to program / Institution
- Granular data *also* enables analysis of what works & what doesn’t…
- Flexible – Allows research streams / Institutes to adapt
- Provides data/information for: Accountability; Transparency; Advocacy; Analysis; Allocation
- But ALSO incentivises improvements in Speed of translation / Probability of translation i.e. Health impact / economic impact

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To conclude...
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- Difference from other approaches
  - Measurement & encouragement to optimise translation & impact
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  - Measurement & encouragement to optimise translation & impact

- To realise this objective:
  - Place research/researcher at the centre of assessment
  - Envisage a mechanism to enable researchers to optimise both quality & impact
  - Prospective implementation: \( \uparrow \) speed of translation
  - Enhance productivity by increasing probability of translation & impact across whole system
Next steps...

- Publications:
  - Deeming, S., A. Searles, P. Reeves and M. Nilsson (2017). “Measuring research impacts in Australia’s Medical Research Institutes: A literature review and analysis of the objectives for and capabilities of research impact assessment frameworks" Journal of Health Research Policy and Systems (Forthcoming); and Three papers in final production

- Paucity of evidence
  - Implementation: Observational studies of NHMRC CREs
  - MRIs as Trojan Horse; Opportunity to set agenda & dictate what we need to progress

- Contact: Simon.Deeming@hmri.org.au
THANK YOU
Questions?

In partnership with our community

LEADING RESEARCH FOR LIFE CHANGING RESULTS