HMRI
Hunter Medical Research Institute

Measuring (and encouraging) research impact in MRIs

Presentation to the *Strategy Meeting, AAMRI Convention*

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Professor Michael Nilsson

9th November 2016

In partnership with our community

THE UNIVERSITY OF NEWCASTLE AUSTRALIA

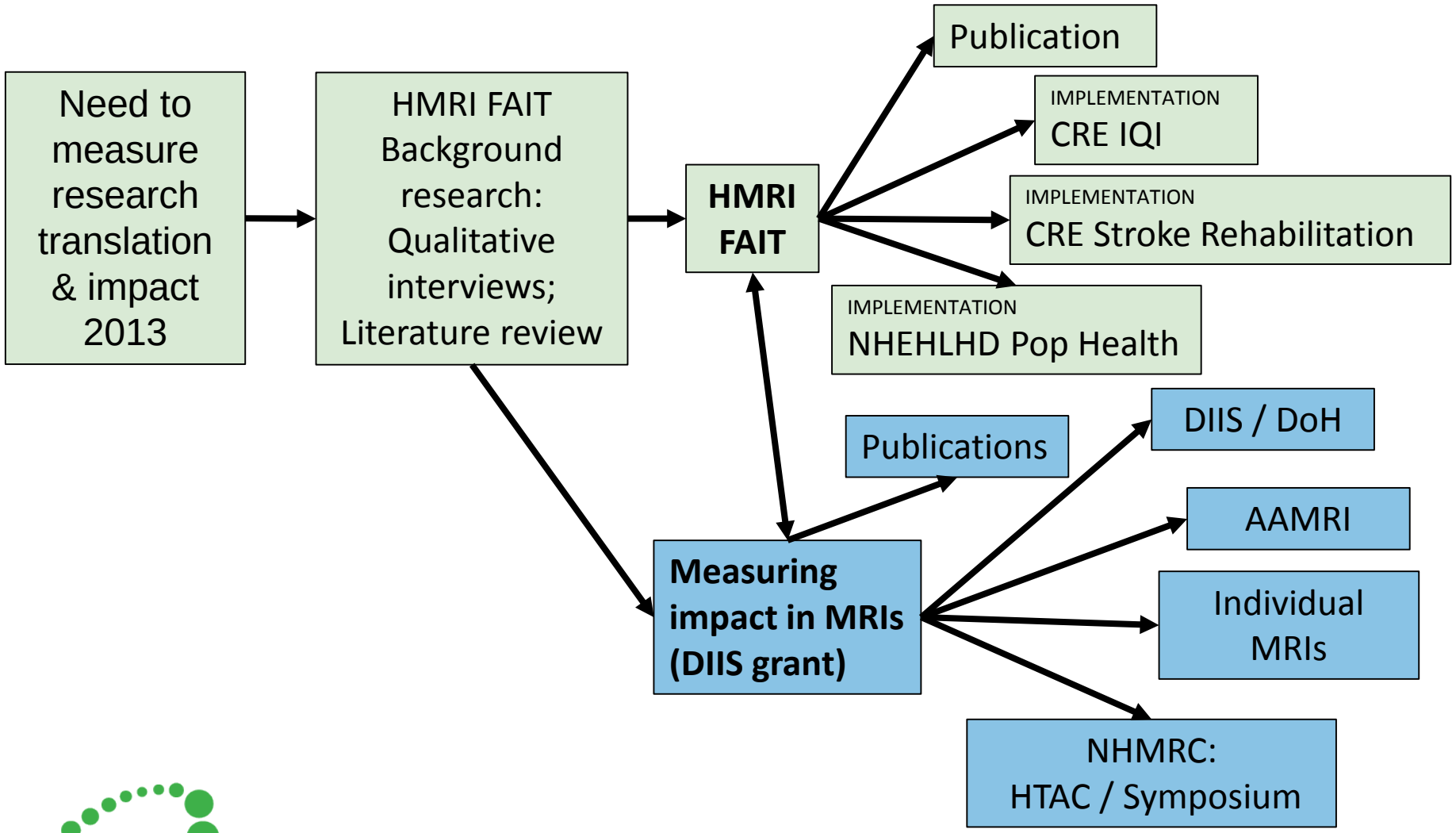
NSW GOVERNMENT Health
Hunter New England
Local Health District

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



WHY MEASURE IMPACT?

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  1. Budget pressure: Justify research expenditure

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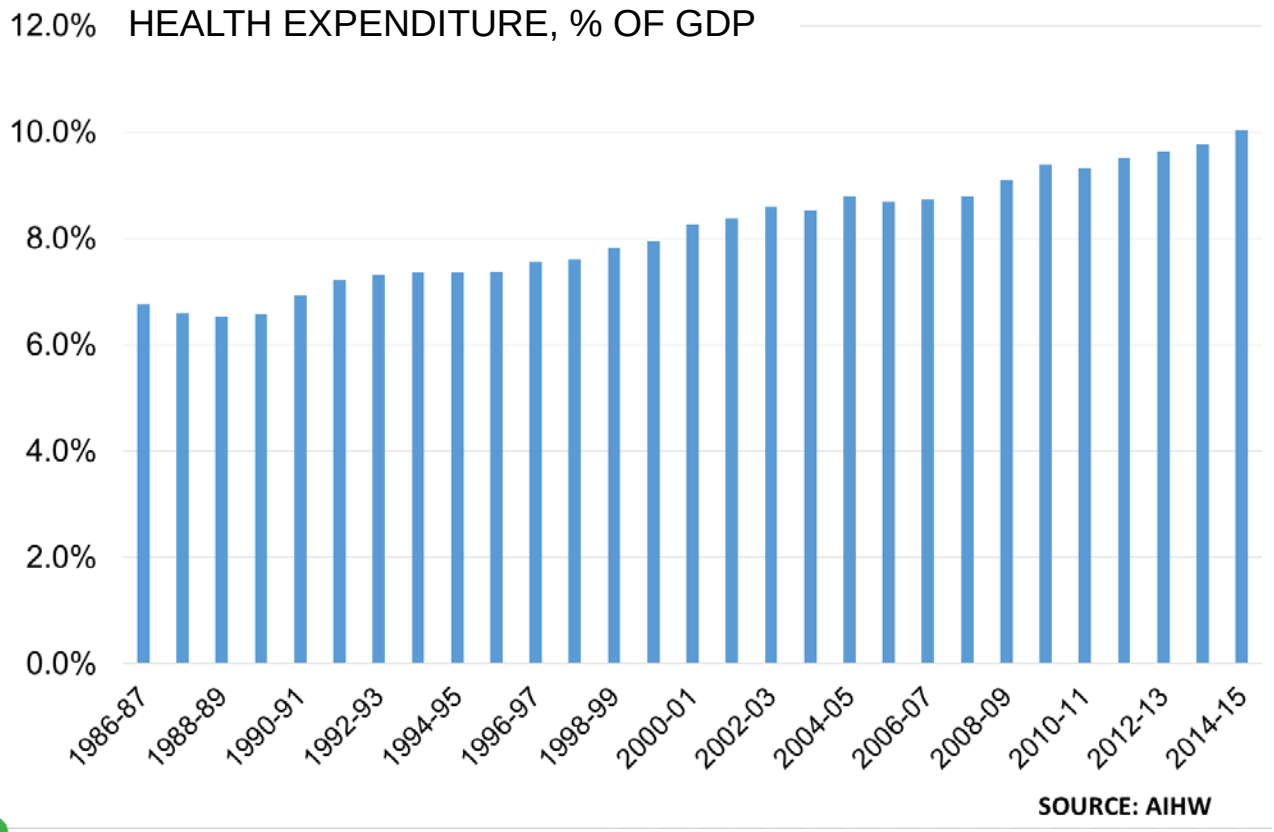
     - Efficiency: Innovation to improve health outcomes / identify low value care

Why measure impact?

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



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     - Growth: Optimise commercial innovations

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     - Efficiency: Innovation to improve health outcomes / identify low value care
     - Growth: Optimise commercial innovations
  3. Encourage high value, low waste research: Embed translation & impact

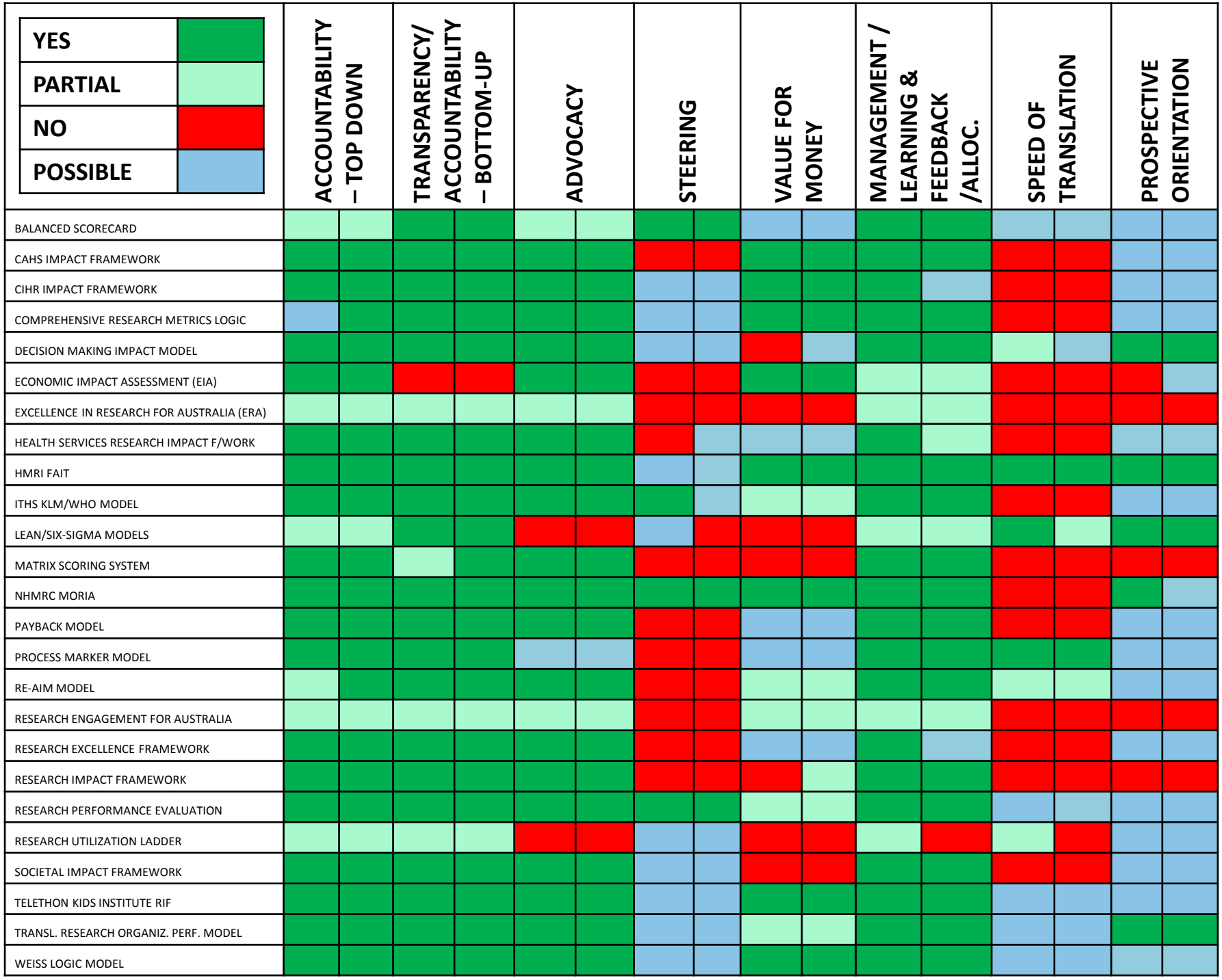
     (*Chalmers, Glasziou, Grimshaw, Ioannidis et al*)

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

Deeming, S., A. Searles, P. Reeves and M. Nilsson (2017). “Measuring research impact 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).


YES
PARTIAL
NO
POSSIBLE
ACCOUNTABILITY – TOP DOWN
TRANSPARENCY/ ACCOUNTABILITY – BOTTOM-UP
ADVOCACY
STEERING
VALUE FOR MONEY
MANAGEMENT / LEARNING & FEEDBACK /ALLOC.
SPEED OF TRANSLATION
PROSPECTIVE ORIENTATION
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 F/WORK
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

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

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

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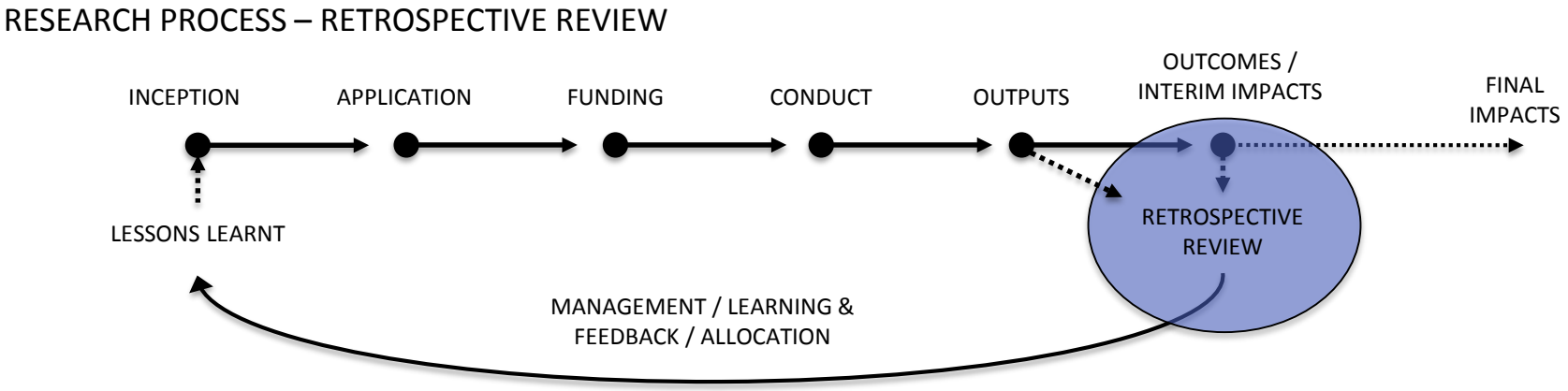
- An over-arching objective to enhance productivity by increasing probability of translation & impact across whole system
- Envisage a mechanism to enable researchers to optimise quality & impact

EXAMPLE: HMRI FAIT

Framework to Assess the Impact from Translational health research

EXAMPLE: HMRI FAIT
FIG 1: Researcher focus; Prospective orientation



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

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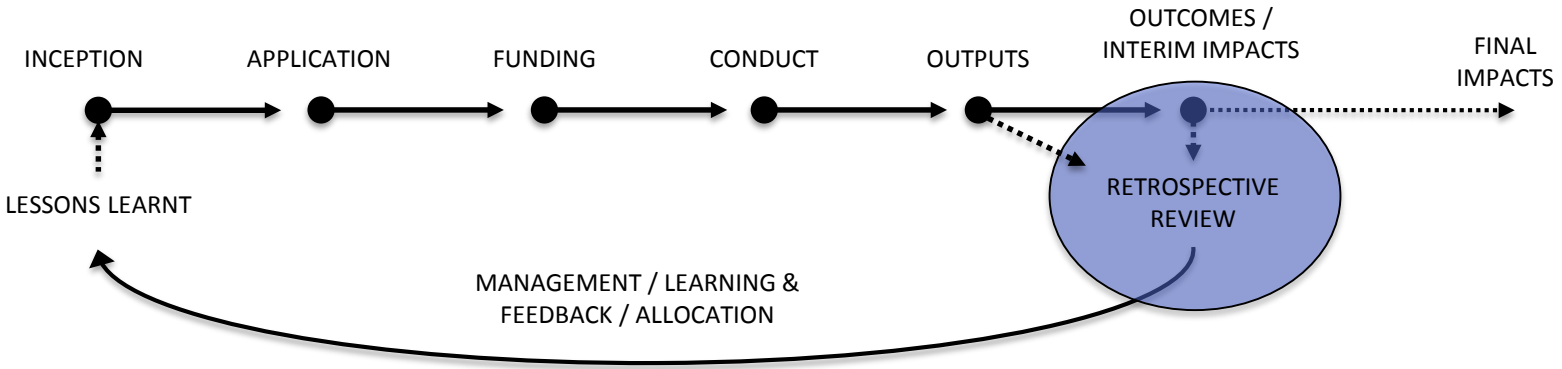
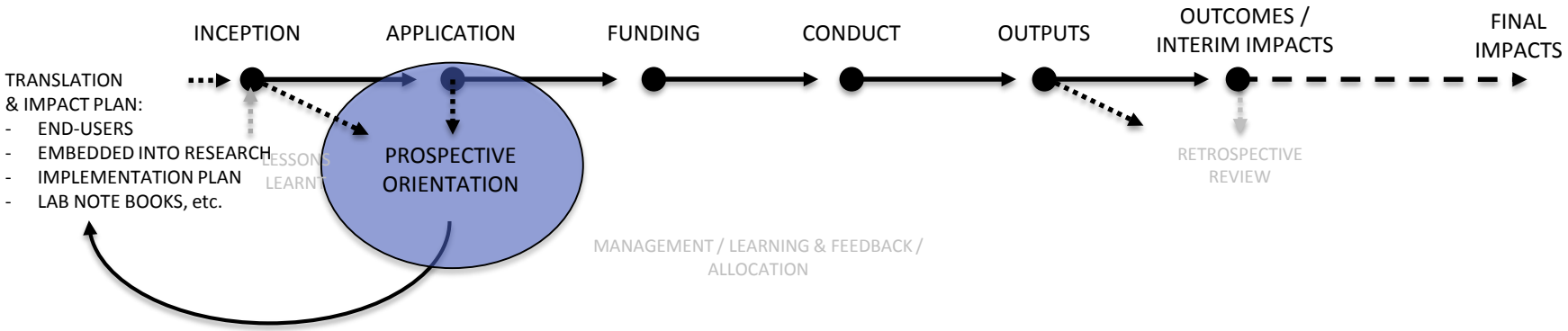
RESEARCH PROCESS – RETROSPECTIVE REVIEW



RESEARCH PROCESS – PROSPECTIVE ORIENTATION (Improved speed of translation)



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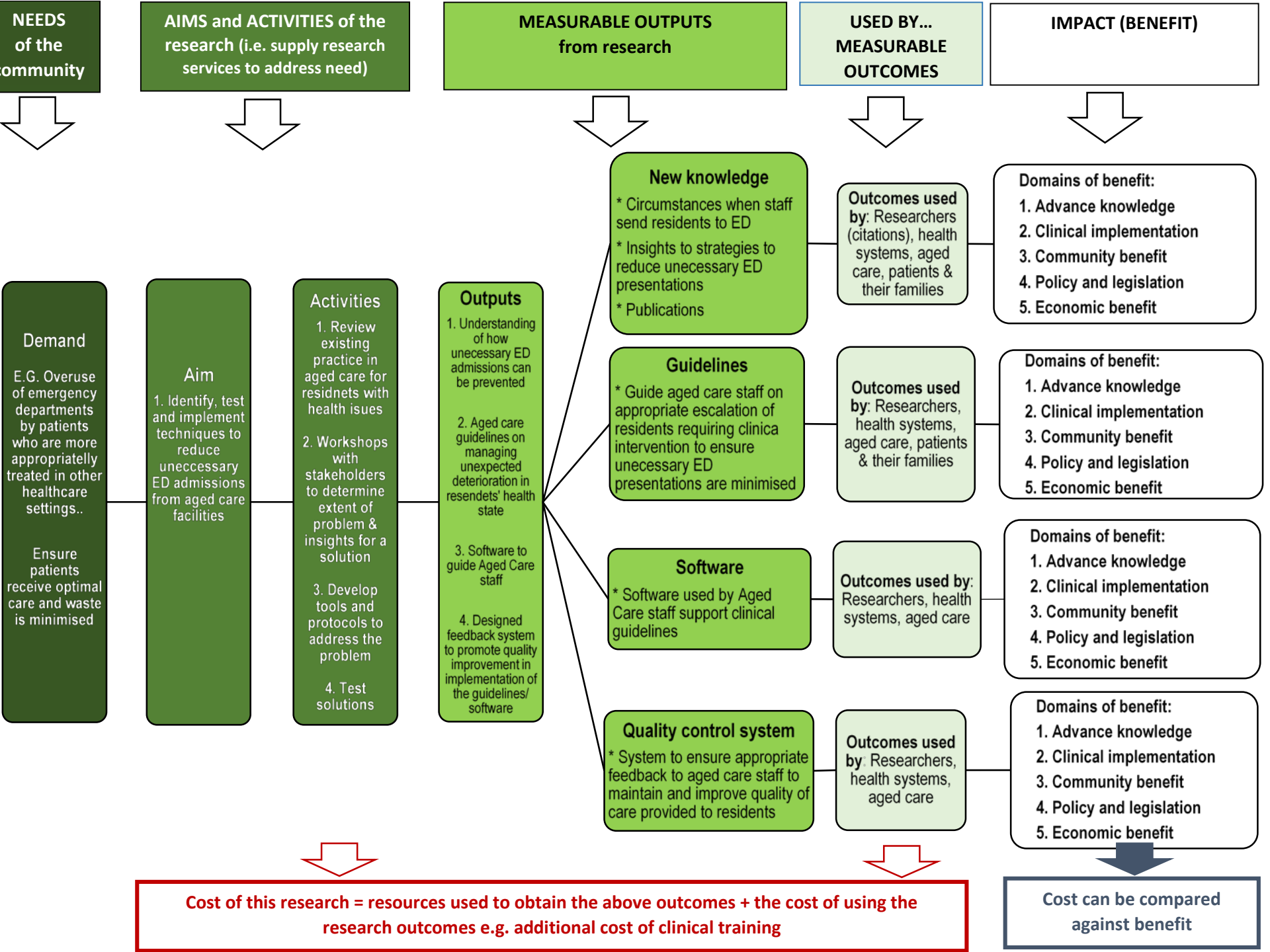

NEEDS of the community
AIMS and ACTIVITIES of the research (i.e. supply research services to address need)
MEASURABLE OUTPUTS from research
USED BY… MEASURABLE OUTCOMES
IMPACT (BENEFIT)
Demand
E.G. Overuse of emergency departments by patients who are more appropriatelly treated in other healthcare settings..
Ensure patients receive optimal care and waste is minimised
Aim
1. Identify, test and implement techniques to reduce uneccessary ED admissions from aged care facilities
Activities
1. Review existing practice in aged care for residnets with health isues
2. Workshops with stakeholders to determine extent of problem & insights for a solution
3. Develop tools and protocols to address the problem
4. Test solutions
Outputs
1. Understanding of how unecessary ED admissions can be prevented
2. Aged care guidelines on managing unexpected deterioration in resendets' health state
3. Software to guide Aged Care staff
4. Designed feedback system to promote quality improvement in implementation of the guidelines/ software
New knowledge
* Circumstances when staff send residents to ED
* Insights to strategies to reduce unecessary ED presentations
* Publications
Outcomes used by: Researchers (citations), health systems, aged care, patients & their families
Domains of benefit:
1. Advance knowledge
2. Clinical implementation
3. Community benefit
4. Policy and legislation
5. Economic benefit
Guidelines
* Guide aged care staff on appropriate escalation of residents requiring clinica intervention to ensure unecessary ED presentations are minimised
Outcomes used by: Researchers, health systems, aged care, patients & their families
Domains of benefit:
1. Advance knowledge
2. Clinical implementation
3. Community benefit
4. Policy and legislation
5. Economic benefit
Software
* Software used by Aged Care staff support clinical guidelines
Outcomes used by: Researchers, health systems, aged care
Domains of benefit:
1. Advance knowledge
2. Clinical implementation
3. Community benefit
4. Policy and legislation
5. Economic benefit
Quality control system
* System to ensure appropriate feedback to aged care staff to maintain and improve quality of care provided to residents
Outcomes used by: Researchers, health systems, aged care
Domains of benefit:
1. Advance knowledge
2. Clinical implementation
3. Community benefit
4. Policy and legislation
5. Economic benefit
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

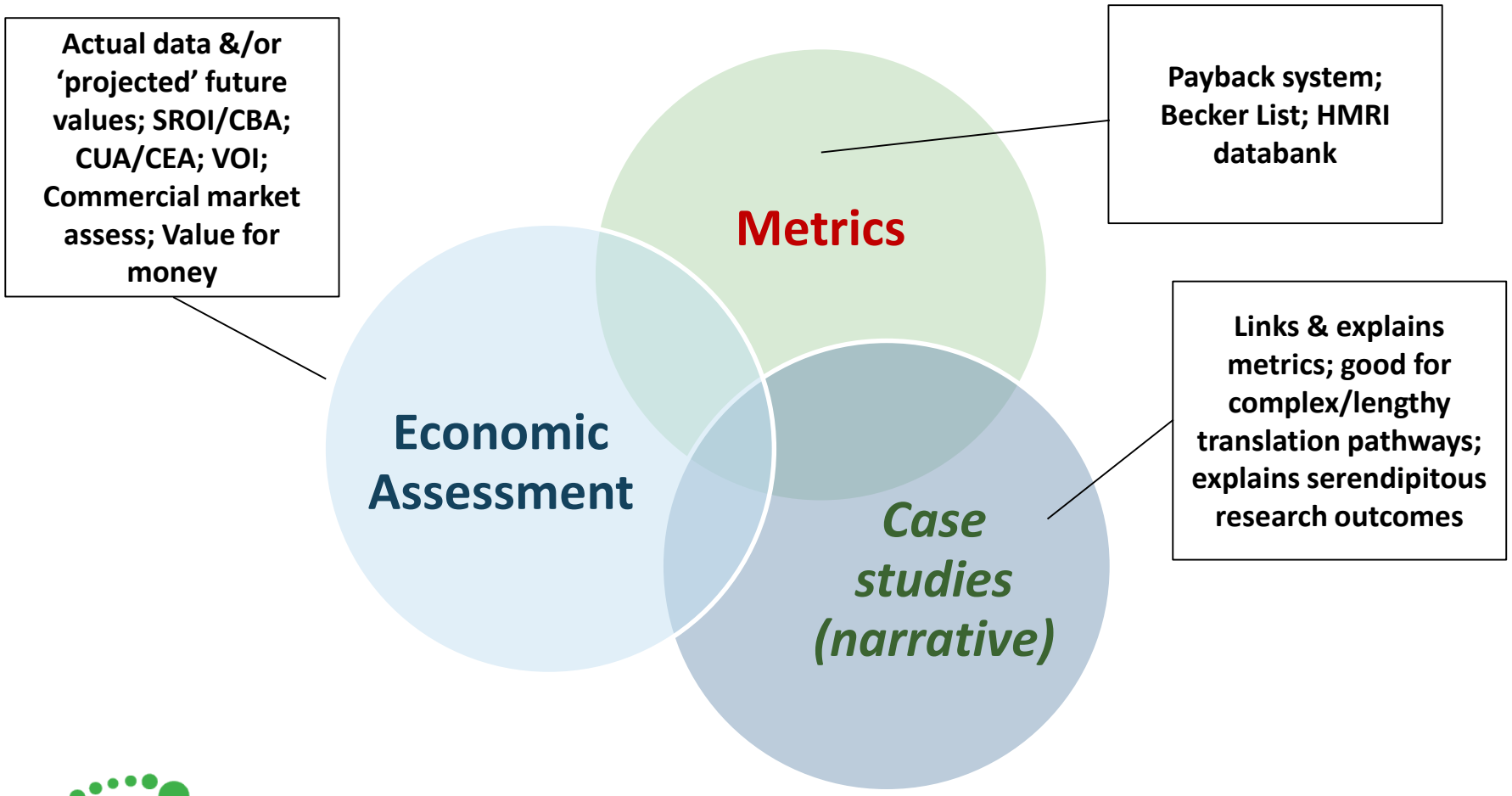


FIG 4

HMRI Hunter Medical Research Institute

In partnership with our community

The University of Newcastle Australia | NSW Government Health Hunter New England Local Health District

PROJECT:

Reducing unnecessary Emergency Department visits by residents of aged care facilities

DOMAINS OF BENEFIT

Metric categories	Metric Types	Metric Value (as a 1 July 2015)
Advance Knowledge	PhD completions Datasets in repository Publications	3 (per $1m funding) 1 4 (per $1m funding)
Clinical Implementation	New clinical guidelines Clinical trial outcomes Aged care decision aid software	1 Protocols to reduce unnecessary Emergency Department (ED) presentations by residents of aged care facilities, reduces ED cohort presentations by 25% in 12 months Software developed that guides aged care staff on streaming patients for clinical treatment
Community Benefit	Improved quality of life (QoL) for aged care residents Percentage point difference in QoL compared to usual care where intervention is conducted	QoL 9 percentage points higher in intervention aged care facilities
Legislation &Policy	Citations in policy documents	1 – Aged care guidelines for resident care 1 – Referenced by Federal government guidelines for aged care facilities
Economic Impact	Costs avoided in health system	Test region: based on opportunity cost, $230,000 p.a. in cost avoided calculation based on reduction in unnecessary ED presentations

ECONOMIC ASSESSMENT – SOCIAL RETURN ON INVESTMENT

Metric categories	Metric Types	Metric Values
Cost of research	2015 $	$575,000
Cost of using research outputs	Based on costs of additional clinical training (10yrs, discnt.)	$1.7 million
Benefit – Monetary values	Opportunity cost of costs avoided in EDs (10yrs, discnt.)	2.2:1 or $2.20 of benefit generated for every $1 of cost

CASE STUDIES

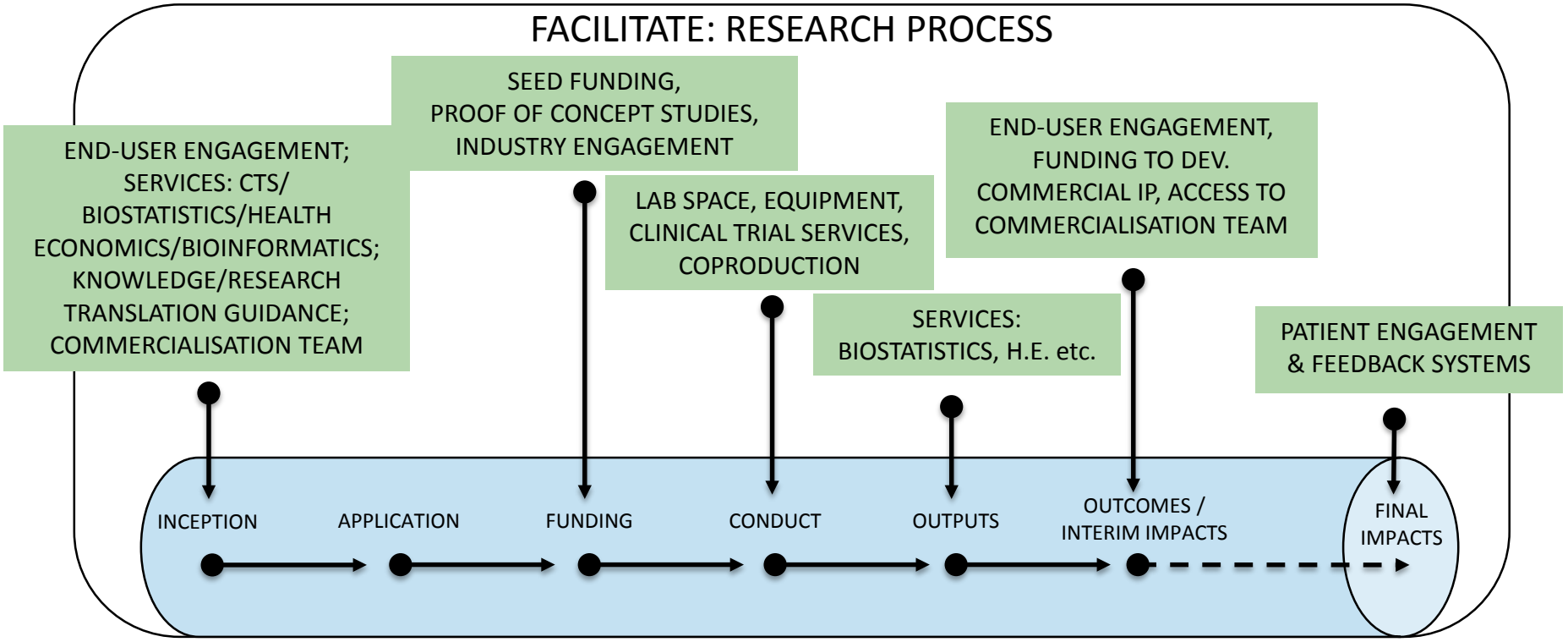
Community need: In the absence of alternatives, staff from the aged care facilities are acting in a rational and conservative manner by sending unwell residents to Emergency Departments (ED). As a result, EDs receive many low acuity patients from aged care facilities who clinicians believe would be more 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 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 thresholds) 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: 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

To conclude…

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

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- Difference from other approaches
  - 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: ↑speed of translation
  - Enhance productivity by increasing probability of translation & impact across whole system

Next steps…

- Publications:
  - Searles, A., C. Doran, J. Attia, D. Knight, J. Wiggers, S. Deeming, J. Mattes, B. Webb, S. Hannan, R. Ling, K. Edmunds, P. Reeves and M. Nilsson (2016). "An Approach to Measuring and Encouraging Research Translation and Research Impact." Journal of Health Research Policy and Systems **14**(60).
  - 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

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THANK YOU
Questions?

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