A New Paradigm for Rural and Remote Research?: An Illustrative Case Study

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Implementation research in the context of a rural and remote environment with:

• Large geographical distances

• Low population densities and numbers

• Limited service availability.
• WA accounts for 33% of the continent (2,529,875km²).

• Australian population 24.7 million

• WA population (10%) 2.6 million

• 83% (2.2 million) of WA population live in metropolitan Perth.

• 3% of WA population is Indigenous.

• 12.5% of Midwest and Pilbara populations and 3% of the South West population are Indigenous.
An Illustrative Case Study

- Chronic conditions, including cardiovascular disease (CVD), are a major health burden in Australia.¹,²

- CVD outcomes are poorer for people living in rural and remote areas compared to metropolitan residents.³

- Between 1995 and 2005, more than 50% of CHD deaths in WA were due to repeated events.⁴

- Cardiac Rehabilitation (CR) improves clinical outcomes and reduces subsequent cardiovascular events.⁵

- Alternative approaches to CR have been developed that are as effective as traditional models.⁶

¹ Australian National Chronic Disease Strategy, 2006
² AIHW. CVD Australian Facts 2011
³ ABS Australian Social Trends 2011
⁴ Briffa et al. Circ Cardiovasc Qual Outcomes 2011
⁵ Briffa et Med J Aust, 2009
Evidence of Cardiac Rehabilitation in WA

- An assessment of rural and remote CR services in Western Australia (WA) in 2015 identified:
  - Non-comprehensive programs: exercise and informal education
  - Program inflexibility
  - Small referral and attendance numbers
  - Limited use of technology
  - Under-representation of Indigenous people
  - No standardised data collection
  - Health pathways that ensure referral and continuity of care are needed.

Hamilton et al. BMC Cardiovascular Disorders, 2016
Hamilton et al. BMS Health Services Research, 2018
Based on a 10+ year body of research
Development of a Solution

• Worked with industry to develop an innovative approach to cardiac rehabilitation service delivery
• Application of existing knowledge to a wicked problem
• Adaption and implementation of an innovative mHealth approach in a complex environment
• Close a gap in access to CR for rural and remote residents – do it better and learn along the way to inform wider service improvements
• Aims
  o Assess how application of mHealth in rural WA can improve access to and management of CVD and chronic conditions.
  o Understand barriers and enablers of mHealth use in rural settings.
Innovative mHealth Approach to Cardiac Rehabilitation Service Delivery

- CSIRO Care Assessment Platform (CAP) for Cardiac Rehabilitation (CR)
  - Smartphone and internet delivery of home-based CR
  - As effective in improving health outcomes as traditional centre-based CR.
- Mobile Technology Enabled Rehabilitation (MoTER) platform
  - Chronic condition management (CCM)
  - Based on self-management and self-management support framework
  - Patients undertake CR and CCM from their own home within the community with support from health care specialists
  - Modified for Indigenous people in Queensland.

Table 1. Mobile delivery significantly improves primary outcomes over traditional CR care (TCR).

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<thead>
<tr>
<th>Program</th>
<th>CAP-CR (n=60)</th>
<th>TCR (n=60)</th>
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<tbody>
<tr>
<td>Uptake</td>
<td>80% (n=48)</td>
<td>62% (n=37)</td>
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<tr>
<td>Adherence</td>
<td>94% (n=45)</td>
<td>68% (n=25)</td>
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<tr>
<td>Completion</td>
<td>80% (n=48)</td>
<td>47% (n=28)</td>
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<tr>
<td>Attrition</td>
<td>20% (n=12)</td>
<td>53% (n=32)</td>
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Innovative Approach to Cardiac Rehabilitation Service Delivery

• Participatory, collaborative approach
• Acceptability, Feasibility and Modification
• Context-sensitive implementation study
  o Efficacy shown in an RCT
  o Examine implementation in a rural context
• Three different regions of WA
• Replicating Effective Programs Framework (REP)\(^1\)
  o Pre-conditions – identification of need and effective intervention
  o Pre-implementation – customise delivery, planning, training, pilot test
  o Implementation – ongoing training and support, evaluation, feedback and refinement
  o Maintenance and evolution – integration, wider dissemination, re-customise
## Acknowledgements

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Key Issues and Challenges

- Challenges of the rural and remote context in WA
  - Geographical distances
  - Low population densities and numbers
  - Service availability

- mHealth app with RCT evidence and Indigenous adaption

- Cardiac Rehabilitation sits in a space that influences both primary and secondary prevention
Key Issues and Challenges

• Challenges and effort to raise partner funding
  o Competitive applications for partner contributions

• Distance from Canberra

• Costs
  o Engage with communities and Regional Health Forums
  o Engage with health services around investment
  o Researcher time and energy
  o Raised expectations

• Commercialisation
What appropriate study designs and methodologies can be utilized to overcome research and implementation challenges in complex environments with contextual differences?
Thank you
MoTER-CR System Model

Monitoring & Management

Patient

Smartphone & app

Portal

Mentors

Devices

Educational Material

What is a Heart Attack

Blood clot

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Replicating effective programs framework for health care interventions. This figure outlines the Replicating Effective Programs (REP) process as it can be applied to health care interventions.