

Research and Disaster Management

Reference Guide – RG.1.006



PPRR DM GUIDELINE – SUPPORT TOOLKIT

Last Updated: 19 January 2018



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1. Overview

1.1. Research

Disaster management research in Queensland should be:

- *responsive* by aligning to state and federal strategic directions as well as reflecting sector/practitioner-identified issues and opportunities
- *collaborative* via promotion of links between researchers, policy makers and practitioners to:
 - frame the problems to be tackled and the questions that need to be answered
 - undertake the research and ensure methodologies are appropriate for the questions being asked
 - interpret and share research to support continual improvement and build knowledge
- *accessible, practical and actionable* by practitioners,
- *accountable* through the use of contestable, ethical and responsible processes.

The Office of the IGEM is responsible for enabling a sector-wide, collaborative approach to research across all elements of disaster management.

1.1.1. Disaster Management Research Framework

The Disaster Management Research Framework was developed to support collaborations between the tertiary and disaster management sectors, and to promote the use of research by disaster managers. Key audiences of the framework include Queensland disaster management practitioners and stakeholders, and the research sector.

The purpose of the Disaster Management Research Framework is to collaboratively develop and promote research, for the Queensland context, for frontline disaster management practitioners, by championing partnerships, cooperation and understanding between academic institutions and government agencies. The goals of the framework are to:

- develop a coordinated approach to undertaking, managing and sharing research
- support the development of strategic research priorities for the disaster management sector
- promote engagement between government and the tertiary sector
- promote transitions between research and practice.

The framework, illustrated below focuses on the development of relationships between researchers and decision makers/industry sectors.

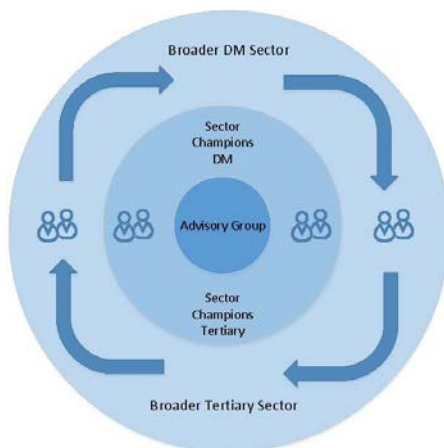


Figure 1 – The Disaster Management Research Framework was developed to support collaborations between the tertiary and disaster management sectors.



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1.1.2. Knowledge Brokering

Knowledge brokering involves activities which connect policy makers and practitioners to researchers to help create partnerships, enable a better understanding of each other's goals and practical requirements, and promote the use of research-based evidence in decision making.

IGEM is a key knowledge broker within the Disaster Management Research Framework and is responsible for the application of the framework within Queensland.

A detailed discussion on effective practices for disaster management and research is provided in the toolkit.

2. Research and Disaster Management

Research and experimental design is defined as '*creative and systematic work undertaken in order to increase the stock of knowledge – including knowledge of humankind, culture and society – and to devise new applications of available knowledge*'¹

Research and Disaster covers three types of activity: basic research, applied research and experimental development²:

1. Pure or basic research is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any particular application or use in view.
2. Applied research is original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific, practical aim or objective.
3. Experimental development is systematic work, drawing on knowledge gained from research and practical experience and producing additional knowledge, which is directed to producing new products or processes or to improving existing products or processes.

For an activity to be a Research and Disaster activity it must meet five core criteria³:

1. To be aimed at new findings (novel)
2. To be based on original, not obvious, concepts and hypotheses (creative)
3. To be uncertain about the final outcomes (uncertain)
4. To be planned and budgeted (systemic)
5. To lead to results that could be possibly reproduced (transferable and/or reproducible).

'Researchers' may be used to engage in research and development activities. These 'researchers' are '*professionals engaged in the conception or creation of new knowledge. They conduct research and improve or develop concepts, theories, models, techniques instrumentation, software or operational methods*'⁴. Researchers are found throughout the private and public sector, internal and external to universities.

¹ OECD (2015) Frascati Manual 2015: Guidelines for Collecting and Reporting Data on Research and Experimental Development, the Measurement of Scientific, Technological and Innovation Activities, OECD Publishing, Paris, pp 44-45.

² *Ibid.* pp 45

³ *Ibid.* pp 46-48

⁴ *Ibid.* pp 379





3. Research and Continuous Improvement

The tertiary and disaster management sectors have identified the importance of practice being grounded in current research and evidence. Stakeholders contend with a range of critical junctures and decision points, including⁵:

- Interpreting, critiquing and applying research relevant to emergency and disaster management; including why and how this knowledge informs best practice.
- Conducting high quality research that is relevant to current and emerging industry needs.
- Identifying, developing and communicating future directions and strategies to enhance the emergency/disaster management body of knowledge.

This approach is facilitated by the management of lessons identified from operations or training. The [national handbook for lessons management, produced by the Australian Institute for Disaster Resilience](#), applies a model which consists of four steps.

These steps are underpinned by continuous stakeholder engagement:

1. The collection of observations through active (interactions) and passive (documentation) opportunities:
 - activities, such as observing an actual event or actions, or training events and exercises
 - planning sessions and conferences
 - submissions by an individual or a group
 - reports, articles, documents and reviews
 - After Action Reviews (AARs), post-event reviews or debriefs.
2. Analysis of the collected data to identify trends or themes; development of treatment options/recommendations and performance measures; and the verification/authorisation of outcomes. A lesson is said to be identified once the relevant authority in the organisation has accepted the report and recommendations.
3. Implementation with the organisation through an action plan and identified activities.
4. Monitoring and reviewing to establish or confirm the success or outcomes of implementation activities. This will ensure the implementation progress is on track and/ identify opportunities to adjust activities. Quantitative and qualitative measures can be used to assess:
 - changed behaviour or culture
 - increased operational effectiveness
 - better resource efficiency
 - improved safety
 - improved community outcomes
 - increased compliance with policy, processes and procedures.

3.1. The Research and Continuous Improvement Cycle

The Research and Continuous Improvement Cycle (RCIC) is an ongoing process to support and promote collaboration and the development, translation and use of research by the disaster management sector. The RCIC is based on four stages:

1. Plan
2. Do
3. Translate and Apply
4. Evaluate and Validate.

⁵ CQUniversity Australia (2017) – *Emergency and Disaster Management Research*. Central Queensland University.

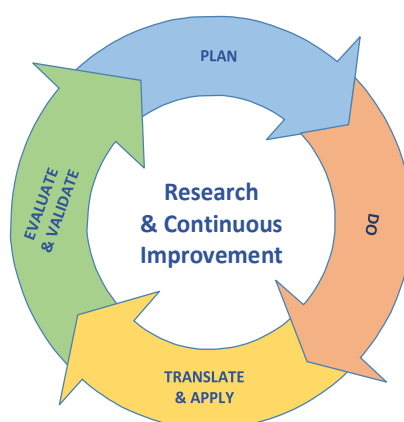




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Figure 2 - RCIC



3.1.1. Plan

Both the [Queensland Government](#) and [Federal Cabinet Implementation Unit](#) have a range of resources and templates designed to assist agencies with the process of planning, managing, implementing and evaluating projects. These can also be used to help scope and plan research questions and outcomes.

The first stage of planning is to identify the problem and questions around which a research project could be developed.

A [Strategic Assessment of Service Requirement](#) facilitates the strategic business decision of whether a project (or research) response is required to address an identified service need.⁶

This can involve the following activities:

- Describing the service need or opportunity to be addressed (including its context, background, and the nature of the service gap and need) - why is this research important? How will this add to the knowledge in this area? What are the research questions?⁷
- A basic review of existing research around the problem/question. There are many online resources to assist with reviewing existing literature and research:
 - [QUT Cite Write](#)
 - [UQ Reviewing Literature - A Short Guide for Research Students](#)
- [Explaining how addressing the service need or opportunity is congruent with, and will contribute to, the agency's mission and vision and government priorities](#)

⁶ The State of Queensland (Queensland Treasury) (2015) Project Assessment Framework - *Strategic Assessment of Service Requirement*. Accessed online 03/07/17 <https://s3.treasury.qld.gov.au/files/paf-strategic-assessment-service-requirement.pdf>

⁷ There are many guides to support research question development. One example is the [PICO concept](#), with the question broken down into:

- P – populations/people/policy/program/problem
- I – intervention(s)
- C – comparison (e.g. to current situation)
- O – outcome desired



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- Defining the outcome sought/targeted e.g., to influence change to a policy, plan or program; modify behaviour/action; encourage investment? Why is this outcome being sought and who is currently being affected? As well as where within the agency does this outcome belong, who are the owners, who is impacted (positively as well as negatively)? [Outcome Mapping](#) can assist with this process.
- Identifying and reporting any business or political sensitivities associated with doing the research and/or implementing change.

When developing a proposal for research, also consider:

- The capabilities and capacities required for the project, do these exist within the agency or would external subject-matter experts be required?
- How and when to collaborate – with other agency units, external agencies, regional partners, existing networks and the tertiary sector. Consider co-investigator roles in conjunction with academics (agency representatives participate in the research processes as an investigator), is there an opportunity to use students for subject-based projects or internships? Inspector-General Emergency Management can assist with developing collaborations between government and the tertiary sector.
- How funding will be sought/obtained – internal agency budgets, external grants? Can the agency provide in-kind (data, expertise, facilitation of meetings and seminars etc.) as well as cash contributions? Values should be calculated based on the most likely actual cost, e.g. current market, current internal provider rates/valuations/rentals/charges of the cost of labour, work spaces, equipment and databases etc.⁸ There are online resources available to help calculate in-kind contributions - [In-Kind Contribution Guide](#)
- What governance framework is required? How will updates be provided and to whom? What are the approval processes (internal agency and external)
- Is ethics clearance required and what are the processes?
- To whom does the research belong and what about intellectual property rights? Does legal advice need to be sought for contract development?
- How will the outcomes and outputs be evaluated? What are the measures of success?

Once completed, the research proposal/strategic assessment of need documentation can be submitted through internal review and approval processes. If successful, a full business case and project plan will be required. Templates and guides to assist the development of a full research project plan/ business case can be found at:

<https://www.tmr.qld.gov.au/Business-and-industry/OnQ-Project-Management-Framework/Templates/Generic-project-management-templates.aspx>

In addition to the information provided in the initial proposal, a detailed research project plan should also consider/include:

- What's in and out of scope - project boundaries
- Any links to the Standard for Disaster Management and Accountabilities?
- Methods and a data collection plan (including a research frame) for example – [Chapter 3 The Lessons Management System](#)
- A detailed budget and timeline
- Risk identification and management
- The development of any contracts and Memoranda of Understanding
- A stakeholder engagement plan

⁸ Australian Research Council (2017) *Linkage Projects - Instruction to Applicants for Funding Commencing in 2017*. http://www.arc.gov.au/sites/default/files/filedepot/Public/NCGP/LP17/LP17_ITAs.pdf Accessed online 27/06/17



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- A communications plan, including how, where and when will results be published/shared
- A monitoring and evaluation plan

3.1.2. Do**Finding the Literature**

The definition of a research question will include the identification of key words and topics that can be used to find relevant literature and existing studies. There are a number of sector-accessible database/subscription services that can be used to obtain research publications and literature⁹. In the disaster management sector, research is not the only evidence that can be used to support decision making. Other key sources of data/evidence can also include: results from scheduled reviews, debriefings, post incident reviews, audit, and external reviews and inquiries. The Australian Institute of Disaster Resilience [Knowledge Hub](#) provides a dashboard with links to industry-specific resources. [Google Scholar](#) now provides access to a broader range of academic publications. Industry associations such as the [Australian Fire Authorities Council](#) (AFAC) and the [Bushfire and Natural Hazards Cooperative Research Centre](#) (BNHCRC) also hold a mix of technical and academic resources, accessible via free, online subscriptions.

Key points to consider when reviewing existing work/literature/research/evidence include:

- What were the conclusions, including any implications for implementation?
- How was it carried out/data collected and analysed?
- What are the gaps, next steps? (this will help situate the current question/problem)

Reference management programs, such as [End Note](#), provide systematic storing of relevant literature/research/articles, as well as assisting during the report writing/referencing/citation process and generation of bibliographies etc. Many of these programs also have online/cloud storage options that can be accessed without requiring additional software installations.

Designing the Research Frame

A research design outlines the ‘framework in which research is undertaken’, including data collection and analysis. Research can be qualitative, quantitative or a combination of both, also known as a mixed methods approach. While there is a range of theory underpinning research approaches, the [United Kingdom Department of International Development](#) notes that it is “*more important – and easier – to understand the assumptions that underpin these ways of doing research*”¹⁰, with three broad groups of research design:

1. Some research designs are better suited for demonstrating the presence of a causal relationship, such as experimental and quasi-experimental designs
2. Others are more appropriate for explaining such causal relationships
3. While some designs are more useful for describing political, social and environmental contexts – such as observational studies.

Collecting the Data

There are multiple ways of collecting data. Quantitative (numerical) data collection techniques include:

- Observing and recording well-defined events (e.g. counting the number of Emergency Alert campaigns)

⁹ <https://doaj.org/>; <https://www.elsevier.com/about/open-science/open-access/open-access-journals>

¹⁰ Breckon, J. (2015) *Using Research Evidence: A Practical Guide*. NESTA Alliance for Useful Evidence. London. Pp. 21. Accessed online 03/07/17

http://www.nesta.org.uk/sites/default/files/using_research_evidence_for_success_-_a_practice_guide.pdf



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- Surveys with closed-ended questions (e.g. face-to face and telephone interviews, questionnaires etc.)
- Factual surveys: used to collect descriptive information e.g. census
- Attitude surveys – e.g. an opinion poll that measures responses on a scale of 1 to 5 etc.

The [Queensland Government Statistician's Office \(QGSO\)](#) provide a range of data sets for Queensland, as well as [guidance on survey/question design](#), collection and analysis. The QGSO can also provide statistical [advisory services](#) for agencies collecting and analysing quantitative information.

A range of government data sets are now accessible online via <https://data.qld.gov.au/> and <http://data.gov.au/>. In Queensland, each agency has a strategy to support data sharing, these can be found online at <https://data.qld.gov.au/article/department-strategies>

*Data sharing allows maximum use of data for statistical purposes, thus enhancing the decision-making capability of governments and communities. It is an important ingredient for supporting evidence-based policy and decision-making.*¹¹

Qualitative data is represented either in a verbal or narrative format. Qualitative data collection methods:

- in-depth interviews and surveys with open ended questions
- observations
- event debriefs
- social, print and electronic media
- documentation review and data mining
- self-reporting
- focus groups and facilitated discussions
- action research.

It is important to note that data collected during research projects must be appropriately stored for specified periods of time (dependent on the type and source). The Queensland Government has a range of [guidance on records/information management, storage and retention](#). If the project is being done in collaboration with a university there will also be institute-specific guidelines for data storage and privacy.

Once data collection techniques have been selected, it is necessary to establish how much data needs to be collected and how often. [Sampling techniques](#) provide frames to identify how collection should occur and allow a level of confidence that results can be generalised back to a population. Sampling techniques can be broadly grouped as either:

1. Probability – when the sample has a known probability of being selected
2. Non-probability Sampling – when the sample does not have known probability of being selected as in convenience or voluntary response surveys

The [National Statistical Service](#) provides online tools and resources that can assist with sampling methods, including a [random sampling calculator](#).

Analysing the Data

Analysis involves techniques and processes that assist with identifying and interpreting the information held within quantitative and qualitative data sets.

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[http://www.nss.gov.au/nss/home.nsf/0/e6c05ae57c80d737ca25761d002fd676/\\$FILE/A%20Good%20Practice%20Guide%20to%20Sharing%20Your%20Data%20with%20Others_November%202009_1.pdf](http://www.nss.gov.au/nss/home.nsf/0/e6c05ae57c80d737ca25761d002fd676/$FILE/A%20Good%20Practice%20Guide%20to%20Sharing%20Your%20Data%20with%20Others_November%202009_1.pdf)



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Quantitative Data

There are two basic types of quantitative data analysis:

1. Summary measures or descriptive statistics, for example frequency tables
2. Variance measures or inferential statistics that examine differences between responses, ranges of outcomes and relationships

There is a range of online guides and resources that can support quantitative data analysis, including:

- <http://www.statsoft.com/Textbook>
- <http://onlinestatbook.com/>
- <http://philosophy.hku.hk/think/stat/>
- http://www.flinders.edu.au/staffdev/uploads/Introduction_Statistical_Analysis.pdf
- Microsoft Excel includes a basic package (Analysis TOOLPAK) for analysing quantitative statistic

Qualitative Data

There is a range of techniques available for analysing qualitative data:

- Content Analysis - content analysis involves coding and classifying data, also referred to as categorising and indexing. The aim of content analysis is to make sense of the data collected and to highlight the important messages, features or findings.
- Grounded Analysis - grounded analysis does not start from a defined point. Instead, themes emerge from discussions and conversations
- Social Network Analysis - this form of analysis examines the links between individuals as a way of understanding what motivates behaviours
- Discourse Analysis - this approach not only analyses conversation, but also takes into account the social context in which the conversation occurs
- Narrative Analysis - this looks at the way in which stories are told within an organisation or society to try to understand more about the way in which people think and are organised within groups.
- Conversation Analysis - conversation analysis requires a detailed examination of the data, including exactly which words are used, in what order, whether speakers overlap their speech, and where the emphasis is placed. There are therefore detailed conventions used in transcribing for conversation analysis.

Online resources to assist with qualitative analysis include:

- <http://www.leaptraining.leeds.ac.uk/research-methods-resources/>
- <https://www.antioch.edu/new-england/degrees-programs/psychology-degree/clinical-psychology-psyd/qr/>

The QGSO also provides a guide for writing reports for quantitative data analysis and generating data tables and graphs. More general research report templates and writing guidance can be found at: https://www.dlswb.rmit.edu.au/lisu/content/2_assessmenttasks/assess_pdf/research_report.pdf

3.1.3. Translate and Apply

The next step in the cycle is to contextualise and apply the research findings. Translating research and embedding it into practice involves two parts:

1. presenting the results and key findings
2. providing additional information that will demonstrate where/how changes to existing practice/behaviour may occur – placing the research results/key findings into the local/agency context.





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Research can be embedded into the [policy/decision making cycle](#) through conversations, networks, research synthesis (key messages in plain language that clearly link to protocols and procedures), incentives linked to milestones in contracts and education/training.¹²

There are many frameworks that can support the translation of research into practice, with common elements including:

- Contextualising/localising the outcomes/outputs to policies, procedures, programs, agency objectives etc.
- Identifying where they can impact policy/program/plan development, processes and delivery how? e.g. links to the Key Outcomes of the Standard for Disaster Management
- Identification of potential barriers to implementation and, where possible, including these in the development of solutions

The [Knowledge to Action \(KTA\) Framework](#), developed within the health sector, consists of two cycles:

1. Knowledge Creation – knowledge synthesis, development of tools/products/outcomes
2. Action – adapting the knowledge to the local context, assessing barriers to use, developing implementation initiatives, monitoring the use of knowledge, evaluating outcomes and sustaining knowledge use.

The KTA framework is underpinned by “sustained interactivity” between researchers, policy makers and practitioners, to support ongoing exchange, to provide opportunities for personal two-way communication, and to facilitate partnership approaches to research-policy initiatives.¹³

¹² Brown, L., Haggard, C., and Bywood, P. (2015) *Understanding the Policy Cycle and Knowledge Translation for Researchers (A Researcher’s guide)*. PHCRIS Round Up Issue 45 December. Accessed online 04/07/17 http://www.phcris.org.au/phplib/filedownload.php?file=/elib/lib/downloaded_files/publications/pdfs/phcris_pub_8450.pdf

¹³ UNDP/UNFPA/WHO/World Bank Special Programme of Research, Development and Research Training in Human Reproduction Department of Reproductive Health and Research (HRP) *Knowledge to Action Framework*. Accessed online 03/07/17 http://www.who.int/reproductivehealth/topics/best_practices/greatproject_KTAframework/en/

