



BUILDING BEST PRACTICE IN CHILD-CENTRED DISASTER RISK REDUCTION

Annual project report 2015-2016

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EXECUTIVE SUMMARY

This Annual Report summarises progress to date on Building Best Practice in Child-Centred Disaster Risk Reduction (CC-DRR), with a focus on 2015-16. The first 2.5 years has included scoping and review, the development of a conceptual framework to guide the research, an utilisation roadmap, and the initiation of pilot and main research. The CC-DRR Project conceptual framework reflects a parsimonious research narrative designed to build on research-policy-practice progress to date but, critically, solve problems and challenges across that nexus. The narrative itself has two guiding questions as follows:

- Are CC-DRR programs effective?
 - Are they stakeholder supported and evidence-based?
 - Do they reflect practice-based evidence, including support for child and youth learning outcomes and for DRR and resilience outcomes?
 - Do they produce cost savings-related outcomes?
- Can CC-DRR programs be implemented effectively, including in scaled, and sustainable, ways?
 - In practice settings including school- and community-based?
 - In disaster- and emergency management-related policy?

Research to date has commenced and is ongoing across these major areas. This includes research started in 2014-15, but continuing in 2015-16, focused on major stakeholders' views, including children and youth, households and parents/caregivers, teachers and school personnel, emergency management/DRR professionals. It includes in 2015-16 initial research on CC-DRR-related student learning and DRR/resilience program outcomes, commencement of costings-related research, and research on implementation obstacles and facilitators for schools and emergency management agencies. With project End Users as primary stakeholders, 2015-16 reflected many consultations and end user capacity-building workshoping. This included their direct involvement in the Project to ensure that current CC-DRR-focused disaster resilience education (DRE) programs reflect their needs and reflect theory and promising, good and best practices (i.e., Through a "co-development and co-evaluation" process with End Users, 2015-16 included developing and refining a CC-DRR Practice Framework. Since its development, the Framework has begun to be used to systematically evaluate End User agency DRE programs to ensure they reflect evidence-based practices (EBP's). The framework incorporates three core dimensions (design, implementation, evaluation) and three guiding principles (collaboration and partnership, protection and participation, diversity and equity) (see Figure 1 on p. 24).

These agency-based DRE programs are now being examined for "practice-based evidence" (PBE), including child learning outcomes and DRR and resilience outcomes. Both EBP and PBE steps are couched within an implementation framework, with project research designed to support both policy- and practice-based implementation of CC-DRR/DRE programs. Research on implementation began in 2014-15 and continues in 2015-16, including the commencement of a PhD study on EM agency implementation policies and practices. This report goes into more detail on this program of research and



related activities, including summarising progress in CC-DRR research to date, as well as some important challenges that have been identified.



END USER STATEMENT

Antonia Mackay, *Australian Red Cross*

Australian Red Cross has been grateful for the opportunity to link in with and contribute to the Child Centred Disaster Risk Reduction (CC-DDR) project. Red Cross has equally been grateful for the guidance and support provided by the project to its school-based preparedness education program, the Pillowcase Project. Prof Kevin Ronan generously reviewed our monitoring and evaluation materials prior to the pilot delivery of the program. After the initial delivery, he also reviewed the materials again, to fine tune them for future delivery. Dr Briony Towers was also instrumental in helping Red Cross devise the learning outcomes for the program. This helped us to articulate from the outset what it was Red Cross wanted to achieve through the delivery of this program, how we were going to measure its effectiveness, and what the obstacles and opportunities were for scalable and sustainable implementation.

This project and the opportunities it has presented for end user-input and face to face engagement has also opened up a space within the Emergency Management sector for all agencies to come together and contribute to meaningful research that supports and improves our collective work in the field.

Andrew Richards, *New South Wales SES*

The Child Centred Disaster Risk Reduction (CC-DRR) project led by Prof Kevin Ronan has involved ongoing consultations with end users children, parents, teachers and school personnel with a view to reconciling a top-down and bottom-up approach to research. Its primary focus is to build best practice in Child Centred Disaster Risk Reduction research to establish whether it works, is effective, scalable and sustainable. The project has involved a review of agency and NGO programs to establish whether they are effective and the key contributors to their success. Agencies have benefitted from a review of programs in terms of disaster risk reduction theory and student learning objectives to better understand how the impact of agency programs can be enhanced.

The opportunities for end-user input I am aware of have included:

- workshops with all end-users in Sydney, Melbourne and Perth
- presentations and workshops at the Sydney and Hobart Research Advisory Forum
- ongoing presentations to the wider AFAC stakeholder groups such as the Community Engagement Technical Group
- one on one staff exchanges with individual emergency services to embed researchers in the organisation and better target the specific outcomes to agency needs
- regular teleconferences with end-users and other researchers in the cluster that result in cross-project collaboration



The utilisation roadmap for the project has been co-created with end-users throughout the course of the project facilitating greater acceptance and includes the following outputs:

- end user capacity building workshops
- best practice guidelines
- practice and evaluation framework
- monitoring, evaluation and implementation toolbox
- drills and gaming simulations.

As the Communications and Warnings Cluster Lead End User I sense a high level of satisfaction from end users involved in the project. Keep up the good work team!



INTRODUCTION

Emerging as a distinct approach to DRR over the last decade, the primary objective of CC-DRR is to strengthen children's knowledge, skills, and interactions so that they, and those with whom they interact, understand disaster risk in their communities and are able to participate effectively in activities aimed at reducing that risk (Benson & Bugge, 2007; Towers, 2015).

In recent years, the role of child- and youth-centred hazards and disasters education has gained increasing emphasis in the international disaster resilience literature (Ronan, 2015a, b; Towers, 2015). The UNISDR *Hyogo Framework for Action* (UNISDR, 2005) explicitly identified disaster education for children as a key priority in the fight to reduce the impacts of hazards and disasters. In the new international accord, the Sendai Framework for Disaster Risk Reduction 2015-2030, children are identified as being particularly vulnerable and disproportionately affected in disasters (p. 4). At the same time, the Sendai Framework also emphasises children and youth as "agents of change" who "should be given the space and modalities to contribute to disaster risk reduction" (p. 20, 36(a) (ii)). In Australia, the role of children's disaster education in managing disaster risk has been recognised as a priority in the National Strategy for Disaster Resilience (Australian Government, 2011): "*Risk reduction knowledge is [should be] in relevant education and training programs, such as enterprise training programs, professional education packages, schools and institutions of higher education*" (p.7). In its final report, the 2009 Bushfires Royal Commission also emphasised the importance of educating children, explicitly stating that it "remains the most effective approach to instilling the necessary knowledge in Australian families" (Teague et al., 2010, p.55). Moreover, the Commission formally recommended that the "national curriculum incorporates the history of bushfire in Australia and that existing curriculum areas, such as geography, science and environmental studies include elements of bushfire education" (Teague et al., 2010, p.2). Of course, the current project has bushfires in scope but also includes a range of other natural hazard events that are common to Australia and New Zealand (e.g., storms, floods, earthquakes, heatwave, drought).

While CC-DRR is becoming increasingly popular amongst government and non-government agencies and organisations around the world, rigorous empirical research on the efficacy of the approach has been scarce, including only one study being published in the academic literature prior to the year 2000 (Johnson, Ronan, Johnston, & Peace, 2014; Ronan et al., 2015). However, since the turn of the century, there has been a surge in child-centred disaster research (see reviews by Ronan, 2015b; Ronan, Alisic, Towers, Johnson, & Johnston, 2015; Towers, 2015) with now well over 40 studies published. This research has confirmed that child-centred disaster practices can confer risk reduction and resilience benefits for children, households and communities. At the same time, research has also identified distinct challenges related to both the effectiveness and implementation of CC-DRR-related programs, including the most common type in Australia, Disaster Resilience Education (DRE).



PROJECT BACKGROUND

A recent review article (Ronan et al., 2016) follows research and other reviews, including one commissioned by UNESCO and UNICEF for the UNISDR Global Assessment Report on Disaster Risk Reduction 2015 (Ronan, 2015), that documents an increase in CC-DRR research over the past 15 years. At the same time, in both Australia, New Zealand and at the broader international level, CC-DRR education programs are rarely subjected to formal evaluation. Those that are evaluated tend to be time-limited, one-off case examples or demonstration projects that have been implemented by schools or emergency management agencies. Thus, a “project mentality” is pervasive in this area. Overall, there is a dearth of systematically gained knowledge about the role of CC-DRR education programs, referred to in Australia as “disaster resilience education” (DRE). Research that examines these programs over intervals longer than immediate pre- and post-test is particularly scarce. Thus, we do have evidence of immediate DRR and resilience benefits (i.e., in the Prevention, Preparedness phase). However, we currently don't know whether CC-DRR initiatives, including DRE programs, are capable of producing increased risk reduction and resiliency outcomes in the Response and Recovery phases of the disaster cycle.

However, a series of systematic reviews have been undertaken by our team, including one recently invited by the *Australian Journal of Emergency Management* (Ronan et al., 2016), a UNESCO/UNICEF-commissioned GAR15 background chapter (Ronan, 2015); another systematic review of evaluations of disaster resilience education programs for children and youth (Johnson, Ronan, Johnston, & Peace, 2014); a critical review and summary paper invited by a high profile journal (Ronan et al., 2015); and a comprehensive review and scoping exercise and compendium (Ronan & Towers, 2015) that was completed as part of the first year of this project. Overall, over 40 CC-DRR studies focusing on disaster resilience education have been published in the grey or academic literature since the mid-1990s, with all but one of those published since 2000. A review of the first 35 studies (Johnson et al., 2014) provides in-depth information about design, methods and basic findings. Overall, these studies do point to the promise of disaster resilience education (DRE). The majority of pre-post studies reported significant gains in knowledge, risk-related perceptions, preparedness and other resiliency indicators (including reduced fears of hazardous events) as a function of a DRE program. Thus, preliminary data suggest that CC-DRR/DRE programs do improve risk reduction and resiliency outcomes during the Prevention and Preparedness phases of the disaster cycle. Across studies, however, the design and methodology could be improved to provide a more in-depth understanding of 1) which program elements produce which gains and 2) the types of outcomes assessed (i.e., most studies rely on knowledge-based outcomes) and sources (i.e., most studies rely on children as sole sources of information). Another major problem with existing evaluations is that they have been carried out by professional evaluation teams from academic settings. Clearly, building the capacity of agencies and schools to systematically evaluate their own programs is a task that merits attention.

Further, research is also necessary to ask the critical question: do CC-DRR/DRE programs translate into effective Response and Recovery for children and their



families? Currently, no study worldwide has examined this question.¹ Another fundamental problem in this area is the problem of scale (Ronan, 2015). As noted earlier indicated earlier, CC-DRR/DRE programs are often limited in size, scope and duration. Teacher survey and focus group research (Amri et al., 2016; Johnson & Ronan, 2014; Kelly & Ronan, 2016; see also Johnson, 2014) appears to indicate a number of obstacles preventing large scale uptake of CC-DRR/DRE programs and initiatives (see next section for more detail).

¹ It might be added that there has been no study done internationally that has looked at a Prevention and Preparedness phase education/intervention program, whether for children or the public more generally, and systematically followed that same cohort into the Response and Recovery phase of a natural disaster. There is an example in relation to prevention and preparedness in relation to housefires in Canada that we document in our scoping and review compendium (Ronan & Towers, 2015).



WHAT THE PROJECT HAS BEEN UP TO

Over the past year, the project has focused on a program of research that revolves around a guiding conceptual model (see p 23). The project's conceptual framework, and accompanying research narrative, is first documented followed by a section that documents progress across each of the main areas of the framework/narrative and an accompanying utilisation roadmap.

RESEARCH NARRATIVE AND UTILISATION ROADMAP

We currently do not have evidence-driven CC-DRR education programs, or activities, that are known to save lives, property, reduce injuries and reduce psychosocial consequences. Related, the current expert- and consensus-advice (e.g., "key messages"; IFRC, 2013; those from important stakeholders²) has not been systematically developed or infused directly in developmentally-sensitive CC-DRR/DRE programs, starting with basic messages for younger children that emphasise child protection and safety (Ronan & Towers, 2014). Additionally, helping children learn important DRR and resilience skills, or adaptive capacities, is also important (e.g., problem-solving; emotional regulation; collective helping and support). With basic messages and skill development in younger years, there is then a foundation that can then be added to and built over time to more advanced topics in later years. Further, getting the balance right in CC-DRR/DRE promoting child protection and child participation is an area of contention in the field (Ronan, 2015). Based on both values (e.g. UN-endorsed rights of children) and research findings (e.g., Webb & Ronan, 2014), both protection and participatory learning are emphasised strongly in this project. At the same time, child participation needs to match a child's cognitive, emotional, and behavioural capacities. With increasing age, and guided participation that matches the child's growing developmental competencies, increasingly more sophisticated forms of child and youth participation are then warranted.

A basic problem in the development and delivery of CC-DRR/DRE programs is that they tend to be one-off, time-limited initiatives that are not systematically infused within the curriculum. Thus, developing evidence-based, expert- and stakeholder-supported curriculum materials that can be implemented on wider and larger scales that help children to acquire essential knowledge skills and values through active learning is necessary. This includes learning that translates directly into effective prevention, mitigation, preparedness, response and recovery behaviours that protect children, families, schools, and communities.

At the same time, research suggests that across both policy and practice, there are significant obstacles preventing the systematic uptake of evidence-supported education programs. At the practice level, focus group and survey research with teachers and principals (Amri et al., 2016; Johnson & Ronan, 2014;

² These include emergency management (EM) professionals, parents/households, teachers/schools and children themselves. In the case of EM professionals, they are aware of local conditions which may impact on key messaging developed by international/national experts. In the case of other stakeholder groups, it is important to see what these groups see as key messages. This would include creating DRR messaging that accounts for widely held myths as well as to amplify widely held messages that are more likely to lead to effective responding.



see also Johnson, 2014), and additional consultation with our BNHCRC end-users, have identified some significant obstacles. Obstacles include a lack of teacher training in CC-DRR curriculum development and delivery, resource and time limitations (e.g., overcrowded curriculum in schools), lack of current policy support for these programs, and the perception that such programs might scare children (Johnson, 2014; Johnson & Ronan, 2014). According to school personnel, a facilitator appears to be support from and partnerships with local EM agencies (Johnson et al., 2014; Amri et al., 2016). Systematic research has begun on what teachers and DRR/EM Professionals in the Australian context see as obstacles and facilitators (Kelly & Ronan, 2016; see later section).

As noted above, there is some policy support for CC-DRR being directly infused in the school curriculum. There are places in the current Australian national curriculum that are identified as spaces within which CC-DRR curriculum can be directly infused (e.g., Year 5 Geography). At a more basic level, while anecdotal evidence suggests practitioners and policy-makers support the general idea of CC-DRR/DRE in the curriculum, there is a lack of research to document that support.³ However, preliminary research has found that both parents and teachers support strongly children being exposed to DRE programming and strong support for their being involved in home- and school-based decision-making. That is, with research-based support for the “aspiration” of CC-DRR/DRE by children, households, schools, EM agencies, this can be used to promote CC-DRR-related policy and curriculum development through “bottom-up” (community-driven) pressure. In addition, pending wider support from stakeholder groups, if CC-DRR program development can also help policy-makers and practitioners solve identified problems (e.g., duty of care; crowded curriculum; lack of teacher training), that may also assist in promoting increased implementation.

Moving from aspirational policy to actual implementation also involves working with relevant government stakeholders (e.g., education and emergency management sectors) and assisting them to advance sector-wide mapping, including ‘scoping and sequence’ policy and planning activities. Such planning is necessary to support the development of a K-12 curriculum that (1) meets children’s developmental needs, (2) inculcates evidence-based or at least consensus-driven DRR and resilience objectives, (3) produces “ultimate” outcomes (saving lives, property, reducing injuries and psychosocial consequences), and (4) overcomes the various implementation obstacles outlined above. Another area for evaluation includes cost-benefit and/or cost utility/effectiveness analyses.

More evaluation is clearly necessary through research that follows a coherent, defined pathway that addresses fundamental issues linked to practice and policy. In particular, rigorous evaluation of the following is necessary: (1) CC-DRR/DRE program content and delivery (e.g., content analysis; fidelity assessment; stakeholder input), (2) program effectiveness in producing important outcomes (including immediate, ultimate and cost effectiveness outcomes) and, finally and critically, (3) effectiveness of implementation practices,

³ An exception here is a mapping exercise conducted through the Australian Red Cross that documents places in the current national curriculum where CC-DRR/DRE can be infused directly or indirectly linked to other core curriculum.



including evaluation of national capacity-building of DRR curriculum and teacher/EM professional training implementation and effectiveness. Research and development is underway across all of these areas (see later sections).

In terms of this overall narrative and related guiding framework (see p 23), it is the opinion of this team of researchers that for large scale implementation of programs, taught by well trained teachers and EM professionals and effective in promoting risk reduction and resilience, requires a different mindset. We need to move from a project-based mentality to a longer-term, strategic design, evaluation and implementation mentality: One that starts with and is “fuelled” through the development of key relationships between key stakeholders across policy-practice-research sectors. However, that longer-term view will benefit substantially from research that evaluates the role of CC-DRR programs in producing immediate and longer-term risk reduction and resilience benefits for children, families, schools and communities.

PROJECT PROGRESS UNDERPINNING GUIDING FRAMEWORK AND RESEARCH NARRATIVE

- Active research and development focused on both effectiveness and implementation of CC-DRR programs and that reflects the conceptual framework discussed in the previous section, derived from a series of scoping reviews of CC-DRR policy, practice and research;
- The active research has included getting important information on both effectiveness and implementation of CC-DRR/DRE programs, including stakeholder wants and needs. Major stakeholder groups include children, households, teachers/school personnel, emergency management/DRR professionals. It has also included additional research focused on effectiveness, including on ensuring the integrity of currently developed programs (see next bullet point) and initial evaluations of school-based DRE program outcomes (e.g., Triple Zero; Red Cross' Pillowcase program). Other agency-based DRE programs are slated to be evaluated in the second half of 2016. These programs include the CFA/SES 'School curriculum hazard and disaster resilience package', AFAC 'Li'l Larrikins Bushfire Safety', ARC 'Pillowcase Project', Fire and Rescue NSW 'Fire ED', NSW RFS 'Guide to working with school communities' and DFES 'Bushfire Patrol'.
- Studies have also focused on DRE practice implementation facilitators and obstacles in classroom and schools settings, with another major study starting to gather data on these same factors for EM agencies. Policy analysis, research and advocacy has also commenced, including through an state government-level education-EM initiative in Victoria (see later section for details);
- Close consultation with project End Users, including a series of capacity building workshops. This has included co-developing with End Users a CC-DRR Practice Framework (see p 22) to evaluate current DRE program integrity/fidelity factors (e.g., design; monitoring and evaluation; implementation). Initial evaluability assessments of End User agency-based DRE programs and resources have been completed. Following this,



evaluation methodologies, methods and procedures have been determined to guide outcome evaluations.

- Close consultation with project End Users to establish a project and implementation road-map, with feedback informing a stepped logic model, linked to core research questions and End User-focused utilisation needs;

Scoping and review of CC-DRR policy, practice and research

Starting in 2014, scoping and review for this project has included a four chapter Compendium that focuses on the following: (1) the national/international context, (2) theory, (3) policy, (4) practice and research in the CC-DRR area (Ronan & Towers, 2015). Additionally, theory, policy, practice, research developments in DRR more generally are presented to help give context for CC-DRR developments. Initially, a five chapter Compendium was planned. However, based on consultation with End Users, one chapter, focused on CC-DRR practice, was initially consolidated with the chapter on research. Thus, the current four chapter compendium opens with an introductory chapter providing some international and national context and rationale for research, practice and policy in this area. Chapter 2 focuses on guiding theory across the policy-practice-research nexus. Chapters 3-4 focused on CC-DRR (and DRR) policy and on CC-DRR (and DRR) practice and research, respectively. The compendium was put out to review to international experts, to End Users and to project team members. Reviews were requested by June 30 2015, with feedback then being used to make improvements. Since then, other improvements continue to incorporate important developments in research, practice and policy. Following the finalising of the Compendium in the second half of 2016, a brief version will then be distilled for sharing with End Users and others on best practices discerned to date.

Following ongoing consultations with End Users, including at a full day capacity-building workshop held in Sydney prior to the 2015 Research Advisory Forum, another in Melbourne in November 2015, and another series of consultation meetings at the 2016 Hobart RAF, a separate chapter, and journal article, on CC-DRR practice, practice frameworks and related is currently in “co-production” with project End Users (see later section for more detail).

Close consultation with project End Users: Co-production, co-evaluation

The research team has held several meetings and consultations with End Users since the start of the project. By way of background to the 2015-16 financial year, a face-to-face capacity building workshop was initially planned for the end of 2014, soon after getting word on successful BNHCRC funding. However, as we then ran that idea by End Users, there was consensus opinion that late 2014 was not good timing, primarily owing to “hazard season” concerns (e.g., bushfire risk high at end of year; floods also are not uncommon) needing their attention and availability. Thus, based on a “what’s most convenient for most”, the capacity building workshop was then moved to occur right prior to the BNHCRC Research Advisory Forum (RAF) in Sydney in early April 2015. Thus, following several teleconference-based meetings with End Users, including one in March 2015 and others in 2014, a full day workshop with End Users was intended to help build



capacity linked to CC-DRR policy, practice and research. This workshop presented information on DRR more generally to give context and “funnel” to the CC-DRR landscape. A CC-DRR policy-practice-research nexus was established and was linked to the current project’s core research and utilisation narrative. Emerging from this workshop, and follow-up consultations, was an increased level of clarity about the progression of research and utilisation in this project. That is, End Users at the workshop were unanimous in endorsing a progression of research that moves more from “researcher-driven” to that which is “co-created, co-produced, and co-evaluated.”

While End Users endorsed the research narrative presented (see p 23), another real benefit of that and ensuing workshops and additional individual and collective consultation meetings was that they also expressed a preference for delaying CC-DRR/DRE outcome evaluations until they had been assessed and modified according to the existing evidence-base, through development of a CC-DRR Practice Framework. That is, a number expressed not wanting to move to outcome evaluation before they had their agency CC-DRR/DRE program(s) evaluated first via such a framework to ensure that these programs reflected evidence-based content and delivery. Thus, whereas I as the project leader envisaged doing outcome evaluation at the same time as doing practice framework evaluations, End Users were clear they preferred a stepped, logic model-type process. Thus, one major, current project borne of that first capacity building workshop was to co-develop a CC-DRR/DRE Practice Framework (see p 22). Alongside, co-evaluating agency DRE programs also commenced to ensure these programs reflect the existing evidence- and theory-base.

Thus, in following principles set out in the Sendai Framework about “co-creation” processes, it is the mutual feeling of the team – Project Team and End Users – that close collaboration across each step of the research narrative and utilisation roadmap will produce enhanced benefits (e.g., increased uptake and usage). The resultant output of this Practice Framework and co-evaluation step is first a CC-DRR “main study” article submitted to AJEM, with both Project Team and End Users as co-authors. This will then form the basis of a Compendium chapter on practice guidelines and the Practice Framework itself.

Research and Development: Evidence-based/stakeholder-supported practice; practice-based/user-satisfaction evidence; implementation

Research and development described in this section is linked to the conceptual model described earlier (see p 23) and the utilisation roadmap that accompanies this Annual Report, tied to the two main questions that comprise the project research narrative:

1. Are CC-DRR/DRE programs effective?
 - a. Are programs themselves evidence-based, do they have content and delivery that reflect promising, good or best practice? Do they include input from stakeholders?
 - b. Do programs produce important student learning outcomes and disaster risk reduction and resilience outcomes? Are they cost effective?



2. Can CC-DRR/DRE programs be implemented on large, sustainable scales?
 - a. What are facilitators and obstacles to both local and scaled, sustainable implementation?
 - b. Can programs be constructed that help surmount empirically-identified obstacles, and leverage facilitators, to implementation?
 - c. Can programs be implemented by EM agencies, schools and others on a large scale and produce effective risk reduction and resilience outcomes?
 - d. Can programs be implemented in cost effective ways?

Stakeholder research

The research here is being done by Honours, Masters and PHD students and is intended to get input on important aspects linked to research, practice and policy across these stakeholder groups:

- Children
- Parents/households
- Teachers/school personnel
- DRR/EM Professionals

Barb Kelly, Anto Amri, Julia Crowley, Elisabeth Tooth are doing a combination of quantitative (correlational, experimental) and qualitative research (e.g., interviews, focus groups) across these groups. Additional research is also be conducted by the research team to supplement these projects.

Student research. Data have been collected, analysed and written up by Anto for the purposes of his Masters thesis. With that finalised, these pieces have been converted to two manuscripts and were submitted to refereed journals in the first and second quarter of 2015-16 (linked to deliverables, 2.4.5 and 3.2.1, respectively). Barb finalised data collection in early July 2015, with data analysed and written up a Masters thesis submitted in October 2015. A manuscript is now being written based on this research to be submitted to a refereed journal.

Over the projects conducted by Barb Kelly and Anto Amri, stakeholder views are intended to shed light on important issues linked to CC-DRR/DRE content, delivery, effectiveness and implementation. For example, in Anto's pre-PhD, Masters-level project, children wanted "to know more about how to stay safe from disasters" (96%). They were also seeking a more participatory role in school-based CC-DRR/DRE programs and safety initiatives (83%), and they wanted to be more involved in making their homes prepared for disasters (86%). The research also found that both parents and teachers support strongly children being exposed to DRE programming and strong support for their being involved in home- and school-based decision-making. While teachers did support child participation, they also presented some mixed views that could present



obstacles to children's genuine participation in CC-DRR/DRE programs in classroom settings.⁴

Another exemplar finding was that there was a notable discrepancy between children's perceptions of the extent to which they would be able to keep themselves safe during a hazard event and their factual knowledge about how to stay safe. That is, for the children who indicated they know how to be safe from disasters (71% of the sample), nearly all of this sub-sample (96%) were categorised as having a low-medium level of factual knowledge. In other words, only 4% of children who felt they knew how to keep safe had factual knowledge in the high range. One other exemplar finding worth noting is that teachers rated implementation obstacles and facilitators, both those derived from previous research by our team in New Zealand (Johnson, Ronan, Johnston, & Peace, 2014b) and some additional hypothesised obstacles/facilitators. Findings here replicated and extended this previous research. For example, teachers saw teacher training as the biggest facilitator and deterrent, respectively. Another important facilitator was having partnerships established between schools and local EM agencies/councils, another finding echoing New Zealand findings (Johnson et al., 2014b).

In Barb Kelly's Hons, and then, Masters research, she surveyed a range of stakeholder groups, starting with households (i.e., parents/caregivers). The Hons project looked at various factors linked to community preparedness, with one focus being the role of passive versus more engaged community and household education platforms, including engaged education that involves CC-DRR and its effects. In this study, a child being involved in a DRE program was found to predict household preparedness for disasters (along with perceived personal responsibility for preparing, and reduced negative DRR outcome expectancies). It is worth noting that participating adults who engaged in community-based emergency/safety-related training were also found to have a significantly increased preparedness. Thus, as this study concluded, "engaged" education, including that which includes both children and adults in the preparedness and planning process, appears to be quite important to overcoming low rates of community preparedness for disasters. Thus study is currently being revised for resubmission to *Natural Hazards*.

Barb's Masters-level study collected data from children, teachers and household (parents/caregivers) in Australia. The first study from this dataset on household preparedness found that involving children in community and household DRR is worth pursuing. For example, children participating in DRE programs was found to correlate significantly with an increased participation in household preparedness activities as well as actual household preparedness. Other findings showed that parents support DRE programs with a problem-solving focus. Data from teachers replicates this finding – they too demonstrated a preference for a problem-solving/decision-making learning and teaching platform. Both teachers and parents also supported children being involved in DRE programs. Additionally, household participants (parents/caregivers) supported strongly children actively participating in both school and household decision-making. Finally, the study also found that of the minority of households (29%) who report

⁴ Research supports experiential, interactive and participatory forms of learning versus sole reliance on didactic, text-driven, rote-based learning approaches (Ronan, 2015).



having a household plan for natural hazards and emergencies, very few of these were able to identify more than 1 or 2 actual steps or components of what would be considered as a bona fide plan. This finding that shows a discrepancy between report of a household plan and what constitutes the basic components of an actual plan replicates previous overseas research. This same finding was also replicated in another community survey in Bendigo. These findings are currently being prepared for publication, with the first manuscript to be submitted looking at household/parent-stakeholder factors linked to CC-DRR/DRE.

Additional stakeholder research. Another study, now being led by Briony Towers, is using a Delphi approach with Australian DRR/EM professionals to identify “key DRR and resilience messages and outcomes” across natural hazard events. Currently, “key messages” tend to be top-down driven. For example, the IFRC (2013) did a Delphi-like exercise with international research experts to derive key messages for wildfires (and other hazards). In supporting bottom-up processes (e.g., privileging the views of EM professionals who work at the “coalface”), and in light of the Australian context being different than some other international contexts (e.g., stay and defend versus early evacuation here versus evacuation-only in other countries), it is important to establish where there is agreement, and divergence, from top down-derived (i.e., research- and normative-driven) key messages. The first step here occurred at the Hobart Research Advisory Forum in May 2016. After a presentation and consultation on CC-DRR project specifics, participants from EM agencies (including some of our End Users) were asked to list what they considered to be the most important DRR and resilience knowledge, skill and behavioural outcomes of DRE programs. Work is currently being done to collate this information and move to a next iteration, including collecting data from a larger group of DRR/EM professionals.

Other stakeholder research underway includes the following: 1. CC-DRR/DRE meta-analysis (led by K Ronan and E Alisic; analyses underway, manuscript anticipated for submission late 2016-early 2017); 2. Household planning, preparedness and motivation as a function of resident children at different ages (Kevin Ronan in partnership with Illy McNeill from another funded BNHCRC study based at University of Melbourne; manuscript, initially submitted in second half of 2015; it was recently revised (April 2016) and resubmitted to *Natural Hazards*); 3. Household survey research that builds on and extends Barb's and Anto's research documented above, with a CQU panel sample of c. 1600 nationally representative households. K Ronan won an internal CQUniversity grant for this study, with data collected in the latter half of 2015; data are currently being analysed; 4. Cyclone Marcia-related research, two surveys, one CATI survey;⁵ another, on-line (led by K Ronan, in partnership with BoM, Risk Frontiers, Geoscience Australia, ABC, with funding from BoM and CQUniversity, \$40K); data collected in the second half of 2015, with an initial internal report completed in late 2015; a formative evaluation of the CFA/SES 'School Curriculum Hazard and Disaster Resilience package (led by Briony Towers with \$75,000 of CFA funding for a fulltime research assistant). Another manuscript on main findings slated for submission to refereed journals, and accepted for a

⁵ CATI = computer assisted telephone interviewing; similar to methodologies used by big polling firms such as Newspoll, IPSOS, Galley, others.



AFAC/BNHCRC Conference symposium in Aug-Sept 2016, is currently in preparation.

Evidence-based practice research and development: Current programs

The main study here has been underway, commencing in 2014-15, first with a review of the literature around promising, good and best practices in CC-DRR/DRE programming. Since then, reflecting a co-development process with CC-DRR Project End Users, a CC-DRR Practice Framework has been developed that has undergone a number of iterations, combining evidence and theory with End User input. The initial Practice Framework initially had 12 components. Through consulting with End Users, the Framework now has three core dimensions and three guiding principles (see end of document, p 22, for figure of the Framework). Work then commenced in 2015-16 to co-evaluate End User agency nominated CC-DRR/DRE programs while continuing to co-develop the Framework. In the second half of 2015 and the first quarter of 2016, initial co-evaluations were carried out, with detailed reports provided back to End Users for the purposes of upgrading their DRE programs and resources. An additional output will be in the form of publications, starting with a manuscript submitted to AJEM in June 2016. In addition, other publication outputs include a report (or chapter) with three main parts: 1. Practice Framework guidelines for agencies and 2. Supplementary technical report that presents (a) published evidence and theory underpinning the guidelines and (b) outlines the process of co-production. Additional refereed journal submissions that detail various aspects of the Framework, including the co-production and co-evaluation process, with plans to include End Users as co-authors. The first submission to AJEM June 2016 has a number of End Users as coauthors alongside Project Team members.

Evidence-based practice research and development: Drills-focused program

Work is underway to develop a gaming app, through the funding support of BNHCRC, the National Emergency Projects funding scheme and CQUniversity, that helps children learn, practice and demonstrate DRR knowledge and skills that are linked to drills/simulations. The first set of drills that have been in development within a prototype app are those related to school fire drills, starting with structural fires. As a sub-theme of two Project PhDs (Andrew Clarke, Matt Henry), and the overall Project itself, development, a set of drills-focused learning, and performance-based assessment, modules are also being developed to help children inculcate important DRR knowledge and skills. Scoping research done on school drills has found that drills themselves, when undertaken according to routine drilling procedures, may not help children learn important knowledge and skills. Findings also suggest that routine drilling, undertaken in accordance with "key safety messages" but not accompanied by inculcating other knowledge and skills may in some circumstances potentially produce unintended consequences, including increasing. Such consequences have been documented recently in field observations of children responding to earthquakes in Nepal and in recent research, including studies done in this Project (e.g., Amri et al., 2016; see Ronan et al., 2016).⁶

⁶ As documented in an upcoming article in AJEM (Ronan et al., 2016): While findings to date support that learning key safety messages can confer benefits, this focus may have unintended consequences. In different studies, it has been shown that education programs can improve knowledge of what to do in the event of a hazardous event (Johnson *et al.* 2014a). However, while



Thus, a drills-focused CC-DRR/DRE program and app is intended to help overcome some of the problems identified as well as solve some problems linked to scaled implementation (see later section). The app work is underway with the developer, Chris Mills of Strategenics and his team, and is being informed by an Advisory Panel that consists of interested End Users (four have nominated), Project Team members (3) and children (2 have been nominated, with more likely to be added). Initial versions of the prototype were completed in late 2015 (v1) and early 2015 (v2, Feb; v3, May), with the final version (v4) due June 30 2016. Pilot testing has begun through the Advisory Panel and will be expanded to include research with children, teachers and parents in the first quarter of 2016-17. The learning modules and companion teacher training are being developed through collaborative efforts with two Project PhDs, one focused on learning and training modules (Matt Henry); the other, on performance-based assessment (Andrew Clarke). When completed, the program will be evaluated for outcome effectiveness (see practice-based evidence section that follows).

Practice-based evidence: Outcome evaluation research

A suite of outcome-focused evaluation-focused studies are planned here, including evaluating current CC-DRR/DRE programs as well as newly developed ones. These answer the core question “do CC-DRR/DRE programs produce important (1) student learning outcomes and (2) DRR/resilience outcomes, and (3) are they cost effective?” (see Figure that follows this section). Initial data collection on formal versus informal CC-DRR/DRE (i.e., non-specific involvement in DRE programs) and its effects or has occurred through two projects detailed earlier (Barb Kelly; Anto Amri).

Current CC-DRR/DRE programs that have been implemented, with some initial data being collected include the Triple Zero Kid's Challenge Teacher's Guide and Pillowcase programs, both developed through End User agencies. The Triple Zero Kids Challenge is an effort involving some of our End User agencies, with Briony Towers designing and implementing the evaluation. The evaluation, involving 22 foundation year students, found that the teaching and learning

children may know a correct set of responses, two studies (Ronan *et al.* 2001, Johnson *et al.* 2014) have shown that these same children can also endorse a range of incorrect DRR responses. In some instances, a majority of children may at the same time endorse incorrect responses (Johnson, Johnston, Ronan, & Peace, 2014). Such findings demonstrate that while children may know a correct key safety message, they also believe that other behaviours that raise risk are also correct. Thus, research has demonstrated that children may lack of clarity about which behaviours are the ones that will keep them safe. Additional research shows that children who participate in DRE programs tend to have reduced fears of hazards and increased DRR-related confidence. However, one study has demonstrated that confidence increases do not correspond to knowledge increases (Amri *et al.* 2016). In that study, 71 per cent of the child participants indicated confidence in what to do to be safe in disasters. However, only four per cent of the overall sample had DRR knowledge in the high range category, whereas 96 per cent had knowledge in the low to medium range categories. Another example of unintended consequences are field observations in Nepal during the 2015 earthquakes by Paci-Green and colleagues (2015), who concluded: ‘Notably, school staff in all three Rasuwa schools indicated that some school children that had been taught drop, cover and hold ran back into collapsing stone houses to crawl under tables and beds. The students did not understand how to protect themselves while outside. They stayed inside stone houses, when perhaps they could have exited, as there had been no instruction about how to protect themselves in the most prominent housing type – stone construction’ (Paci-Green, Pandey & Friedman 2015, p. 17).



activities in Teacher's Guide had provided children with essential knowledge and skills for identifying and responding to legitimate emergencies, including major accidents, medical emergencies, fires, and serious crimes.

The Pillowcase program, designed by the Red Cross, has been implemented in a number of schools through the Australian Red Cross (ARC), with initial data collection occurring in 2015. This project has involved collaboration between ARC and this project. The Project Leader (Kevin Ronan) consulted with ARC personnel (John Richardson; Antonia Mackay, Pillowcase project manager), reviewed materials prior to its dissemination and assisted in the development of initial evaluation material. A draft report has been written by Antonia Mackay (ARC), with input to the draft provided (by K Ronan). Additionally, work on a manuscript for refereed journal submission has commenced based on initial findings and based on the fact that the Pillowcase program has some features that can assist in overcoming known obstacles to scaled implementation of CC-DRR/DRE programs. Additional implementation, and companion evaluation, has since followed. An Hons student (Julia Crowley) is evaluating the roll-out of Pillowcase in Central Queensland. Using a mixed methods research design, Julia is combining experimental evaluation (pre-post program) with other qualitative/quantitative methods (focus groups, surveys that gather a combination of quantitative and qualitative data). In addition, using the CC-DRR Practice Framework (see p 22), she will analyse the Pillowcase Project program for use of good, promising and best practices in its design/curriculum/delivery, monitoring and evaluation, and implementation approach and strategies.

Another CQU Hons project being undertaken by Elisabeth Tooth and supervised by Briony Towers, is investigating disaster relief and recovery from the perspectives of caregivers of infants and young children (0-3yrs). Infants, young children and their caregivers have been neglected in disaster research and this is impeding the development of evidence-based policy and practice. Elisabeth's research will provide governments and NGO's with empirical data that can be used to inform the development of education and support services that are specifically tailored to the needs and capacities of caregivers of infants and young children.

Other programs planned for practice-based (outcome) evaluation in the second half of 2016 include those from a number of additional End User agencies, including those currently with whom we are co-evaluating their agency programs' "internals" through the Practice Framework (see p 22). These include NSW RFS, NSW F&R, DFES, Vic SES, CFA, SA CFS, Australian Red Cross and perhaps others (discussions currently being held with additional End User agencies). The other program slated for evaluation in 2016 will be initial aspects of a drills-focused program discussed in the preceding section, starting with evaluation of the gaming app.

One theme in these evaluations of program effectiveness is do they produce important student learning outcomes and DRR/resilience outcomes, both in the short-term and over longer periods of time? Thus, as part of ethics approval, and child/youth-parent participation in these evaluations, we will be asking to follow evaluation cohorts over time to see about longer term risk reduction and



resilience outcomes. This includes in relation to hazards that eventuate prospectively.

Cost-related outcomes evaluation is also underway, starting with a pilot project in partnership with DFES and Fiona Gibson and Veronique Florec from UWA, who are part of another BNHCRC-funded project.⁷

As signalled earlier in this report, one other theme in this line of research is to help agencies develop their own tools for evaluating outcome effectiveness. As introduced earlier, our systematic reviews have revealed that agency-driven outcome evaluations are rarely conducted. In addition, all published outcome evaluations of CC-DRR/DRE programs to date have been conducted by professional evaluators (mainly academic researchers) (Johnson, Ronan, Johnston, & Peace, 2014a). Thus, one utilisation product planned is a tool, or set of measures (and perhaps simple guidelines), that can make outcome evaluations easier to do. See accompanying CC-DRR Utilisation Roadmap for details.

Others studies that are planned include those based on "CC-DRR success stories" (where DRE has led to DRR and resilience outcomes). Related to this theme, and from the data we gather across outcome evaluation studies, we are also interested in which types or combinations of of DRE programs, or which specific components of DRE programs, produce greater benefits.

CC-DRR/DRE Implementation

To support scaled, sustainable implementation of CC-DRR programs, research has been conducted, or is underway, through five RHD projects, Anto Amri, Barb Kelly, Ben Martin and, most recently, Mayeda Rashid and Matt Henry. Four of these RHD projects combine the evaluation of CC-DRR/DRE effectiveness with CC-DRR/DRE implementation (Anto, Barb, Mayeda, Matt). Across these projects, one line of the implementation-focused research is on extending previous research (Johnson, Ronan, Johnston, & Peace, 2014b) that has identified implementation deterrents and facilitators (Barb Kelly, Anto Amri). Findings thus far have replicated and extended earlier New Zealand research (Johnson et al., 2014), confirming and extending our understanding in the Australian context (Kelly & Ronan, 2016) of important obstacles to implementation (e.g., lack of teacher training; crowded curricula) and facilitators (e.g., availability of "ready to go" resources; innovative methods for curriculum inclusion, including combining curricula that revolve around school drills, partnerships with local EM and councils).

Mayeda Rashid's PhD is planning to focus on creation of a DRE program, and teacher training, that takes account of implementation (and effectiveness) factors in a sociocultural context, across two cultural contexts (Australia, Bangladesh). This research is currently in the confirmation process, with the research starting in the second half of 2016.

Matt Henry's PhD is focused on the Comprehensive School Safety (CSS) Framework and its role in facilitating implementation (and effectiveness) of DRE programming.

⁷ Economics of Natural Hazards Project, headed by Prof David Pannell, and including Drs Gibson and Florec.



Ben Martin's PhD project is now underway with the PhD confirmation process now successfully completed. This project is examining CC-DRR/DRE implementation that includes facilitators and deterrents but also takes a more holistic approach. The main aims of the project are:

1. To investigate the current role of EM agencies in the implementation and dissemination of school- and community-based DRE in Australia.
2. To identify how the role of EM agencies in the implementation of school- and community-based DRE can be optimised and enhanced.

As introduced in the previous section, cost-related research is also now underway, in partnership with another BNHCRC project and End User agency, DFES. It is mentioned here to signal the importance of costing-related research as an important consideration in implementation, both policy and practice implementation.

Utilisation products from this line of research include providing a research-developed tool to assist in both policy and practice implementation. This includes assisting agencies/schools implement programs in scaled, sustainable ways, while ensuring their ongoing effectiveness in producing DRR/resilience outcomes. See the accompanying CC-DRR Utilisation Roadmap for more detail.



Figure 1. CC-DRR Practice Framework



BUILDING BEST PRACTICE IN CC-DRR: GUIDING MODEL FOR RESEARCH

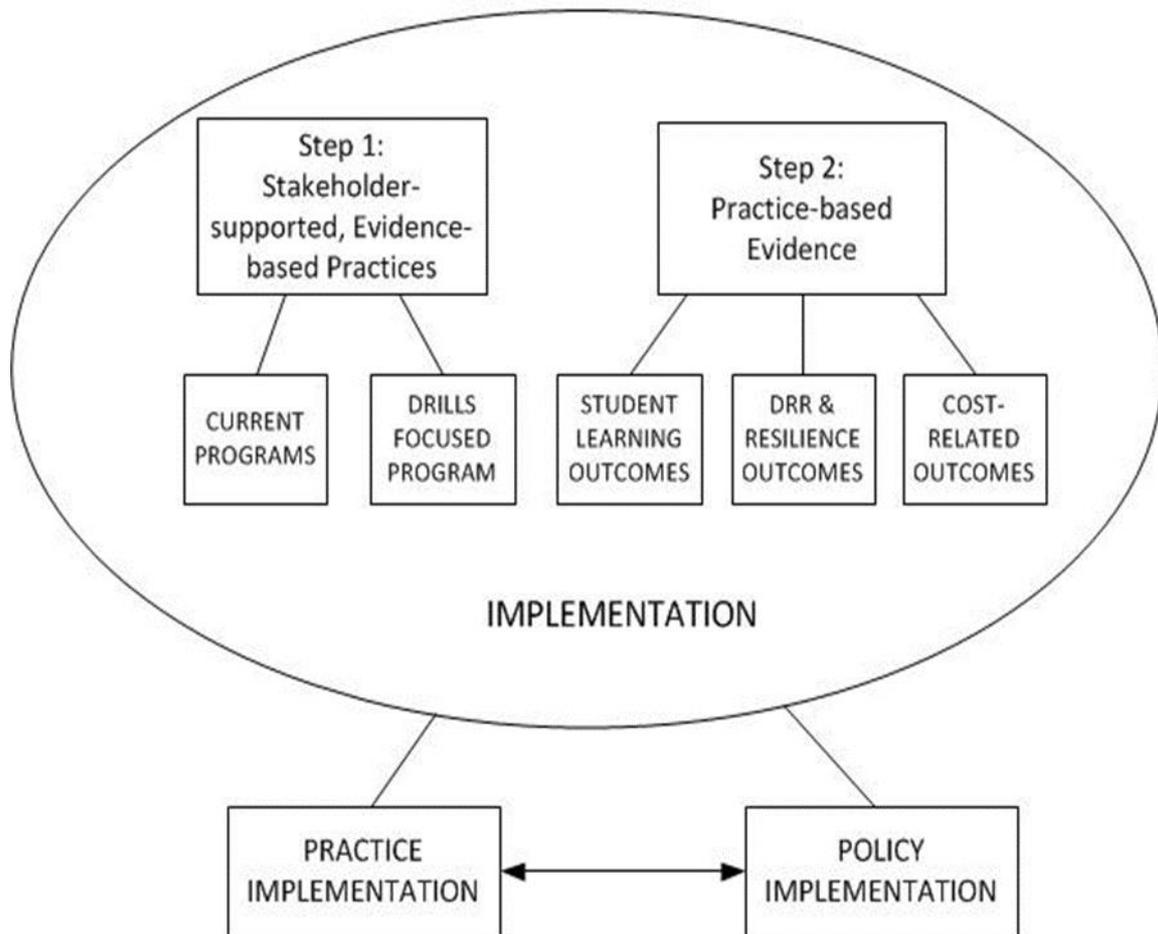


Figure 2. CC-DRR Guiding Research Model



PUBLICATIONS LIST

Ronan, K. R., Haynes, K., Towers, B., Alisic, E., Ireland, N., Amri, A., Davie, S., & Petal, M. (2016). Child-centred disaster risk reduction: Can disaster resilience programs reduce risk and increase the resilience of children and households? *Australian Journal of Emergency Management*: in press.

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Hon & Masters Students: Barb Kelly, Julia Crowley, Libby Tooth.

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NB. Other citations in the text can be found in the previous Publications section.