



# FINAL REPORT

July 2010 to June 2015



**NATIONAL CRITICAL  
CARE AND TRAUMA  
RESPONSE CENTRE**



**Australian Government**  
**Department of Health**

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## Foreword



**Professor Chris Baggoley AO**

*BVSc (Hons), BM BS, BSocAdmin, FACEM, FRACMA, DUniv(Flin)*

Australian Government Chief  
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**H**ealth emergencies are a reality of everyday life; care providers and policy makers spend much time and effort in planning and preparing to prevent, or to respond to, such emergencies. From those directly affected, through to care providers, through to policy makers, they can have a powerful impact. Australians have the benefit of a world leading health system that supports the provision of high quality, timely, urgent care. Each and every jurisdiction in Australia has proven its ability to deal with health emergencies, pandemics or mass casualty events. However, even the strongest of systems can be overwhelmed at times and for our near neighbours, many of whom are still developing robust health systems, this happens all too frequently.

Australia continues to develop a unique national asset to respond to overwhelming health emergencies domestically and abroad. During the past three years I have observed the National Critical Care and Trauma Response Centre (NCCTRC), based in Darwin, undergoing a period of substantial growth in fulfilment of its mandate to provide enhanced medical response capacity across the Top End of Australia as well as overseas. Building on Australia's strong tradition of humanitarian assistance and government sponsored civilian medical teams; the NCCTRC has been a driver of the development of the

Australian Medical Assistance Teams concept and provided a focal point for jurisdictions to engage in training and deployment of their clinical staff. The enhanced cooperation that has developed in the time of this funding period had its greatest success in the deployment of a truly multi-jurisdictional team to Operation Philippines Assist in the wake of Typhoon Haiyan, late 2013. To me, this deployment demonstrated a capacity to work constructively with a number of Commonwealth, State and indeed international agencies to successfully respond to a major international emergency. I have experienced first-hand the strength of the relationship between the NCCTRC and my own office, the Office of Health Protection and the Australian Health Protection Principal Committee (AHPPC). In particular, the way in which the Centre has led through facilitation and coordination has marked its maturation into an effective operational asset for the nation.

There is little doubt that health emergencies, be they a result of natural or man-made calamity, will continue to affect our region. The Commonwealth is well-served in having a major health response asset in the NCCTRC, and I look forward to watching its development into the future.

## Foreword



**Dr Len Notaras AM**  
*Chief Executive of Northern Territory  
Department of Health*

**W**hen the 2002 Bali Bombing occurred the Royal Darwin Hospital was a generalist institution. It had a small emergency department, an 8 bed intensive care unit and no specialist burns service. Whilst it lacked the 'on paper' capability to respond to this tragic event, the individuals within the RDH and the institution itself had a remarkable capacity, a capacity that I have noted since moving to the Northern Territory some 30 years ago, to go above and beyond when faced with an extreme emergency. To give some perspective on those terrible days, the reception of 12 seriously burnt patients to a quaternary hospital following the Black Saturday bushfires was lauded as an extraordinary event. The doctors, nurses and allied staff of RDH received, treated and repatriated 55 Australians, without losing a single patient.

From this tragedy arose the concept of the National Critical Care and Trauma Response Centre, and an enduring partnership between Northern Territory Health and the Commonwealth that capitalises on the regional advantage of Darwin and proximity to one of the world's most disaster prone areas, and the known capacity of Territorians to respond to disaster. The NCCTRC celebrated its 10 year anniversary in 2014. In that time it has become a unique feature in the Territory and Australian health landscape. The Centre serves and indeed achieves the dual purpose of preparing the Royal Darwin Hospital to receive Australian victims of disaster and as an overseas response asset for disaster healthcare offshore. As the Chief Executive of NT Health and before that the Executive Director of the NCCTRC, I have been immensely proud to see the Centre at the forefront of such a variety of health emergencies assisting such a broad range of patients in need. One of the lesser known deployments of the NCCTRC, and one of which I was particularly proud, was the 2012 deployment to Maningrida, in Arnhem Land. In partnership with

the NT Centres for Disease Control a group of AusMAT trained Territorians and colleagues from southern states provided a mass trachoma treatment for an entire indigenous community. This deployment well-demonstrated the versatility and value of the NCCTRC in providing healthcare across a variety of domestic contexts. Along with our major overseas AusMAT deployments, to the Solomon Islands dengue fever outbreak and to the Philippines, the period 2012 – 2014 has been a sustained period of activity for the NCCTRC. As well as response the value of preparedness is inestimable. I have observed firsthand the quality and attention to detail of the AusMAT training packages – they are of international significance. AusMAT courses have seen over 600 doctors, nurses and health logisticians across the nation trained to a uniform standard as medical disaster responders. The NCCTRC has developed a 40 bed mobile field hospital equipped with operating theatres, resuscitation suites, wards and an emergency department. It has taken the lead in international disaster response standards through the secondment of Dr Ian Norton to the World Health Organisation.

Ultimately the NCCTRC has been able to combine local relevance with international excellence and will continue to do so into the future. I am committed to the ongoing relationship with the Commonwealth and NT Health that is the NCCTRC and the custodianship of this vital national asset.



## Executive Summary



**Dr Nicholas Coatsworth**  
*Executive Director*

Over the past five years the National Critical Care and Trauma Response Centre has matured into a unique and critical disaster response asset for Australia. The growth and development of the NCCTRC has been enabled in no small part by its capacity to form sustaining relationships with a variety of key partners in the sector. Of these the relationship with the Commonwealth Department of Health has been the most critical. This funding period has shown that the relationship is more than that of a purchaser and provider, it is a true partnership where the NCCTRC and Office of Health Protection have worked together in two key areas – the sustainable development of trauma response capability for Northern Australia, and the previously uncharted territory of civilian medical team deployments on behalf of the Commonwealth.

Our deployments are the most tangible demonstration of the investment in the NCCTRC. We have worked alongside our state and territory counterparts in refining the Australian Medical Assistance Teams (AusMAT) concept. Despite the challenges of driving a multi-jurisdictional project AusMAT is now in a position to access the very best in clinical staff from around the nation for health emergencies. This was well-demonstrated in the deployment to Tacloban City in the wake of Typhoon Haiyan, when each and every jurisdiction had the opportunity to send clinical staff. The diversification of this capability beyond sudden onset disasters commenced in late 2014 during the Ebola virus epidemic and the NCCTRC now has infectious disease epidemic response as a strategic objective for the coming years. Underpinning our deployable human resources is a state of the art trauma field hospital. Since 2010 the hospital has been refined and now comprises a 100 bed inpatient facility, 2 operating tables, and full resuscitation and outpatient capability. The leasing of a climate controlled warehouse has enabled our activation times to be substantially reduced. The hospital has been viewed by a number of high level delegations and is considered a

unique regional asset. In late 2011 during his visit to Darwin, President Barack Obama met with the Executive Director of the NCCTRC, Dr Len Notaras. In 2012 we were fortunate to host former Australian Prime Minister Gillard and former Indonesian President Susilo Bambang Yudhoyono who viewed the field hospital on full display.

Our unique education and training packages focus on simulated environments to complement classroom teaching. Through our partners we access world-leading educators of the likes of Dr Chris Giannou, chief surgeon of the International Committee of the Red Cross, and Professor Skip Burkle, of the Harvard Humanitarian Initiative. Be it the training of NT Health staff to respond to remote area trauma, or AusMAT employees, the feedback from candidates is consistently high.

To complement the deployable asset and education packages we retain a close clinical partnership with the Royal Darwin Hospital, Top End Health Services and NT Health. The NCCTRC directly services RDH by providing the Trauma Service at a cost of \$2.4 million annually. This has created the environment for accreditation as a level 2 trauma hospital. The reciprocal agreement to provide AusMAT trained clinical staff ensures a highly skilled, heat acclimatised workforce for deployment on behalf of the Commonwealth.

As we look toward the next funding cycle the future for the NCCTRC is full of opportunities. In reading this report I ask that you also consider the final chapter which is the first publication of the NCCTRC strategic plan for 2015 – 2018. The development of this plan is consistent with the ethos of the NCCTRC and was widely consultative, involved all of our staff members, engaged all state health jurisdictions through their Chief Health Officers, and our partners in Commonwealth agencies. The product is a clear statement of direction that will preserve and develop this vital national asset into the future.

# Section 1

## Response and Deployment



### Highlights

- » *Operation Pakistan Assist II* – Pakistan Floods August - October 2010. 11375 patients treated during a seven week civil-military deployment
- » Dengue Fever outbreak – Solomon Islands April - May 2013. Infectious Disease health emergency response to the Solomon Islands
- » *Operation Philippines Assist* – Tacloban City November – December 2013. deployment of the full field hospital in the wake of Typhoon Haiyan, treating 2734 patients
- » Endemic Trachoma - Maningrida, East Arnhem Land, March 2013. Response to the endemic eye disease trachoma with the Northern Territory Centres for Disease Control
- » *Operation Pacific Assist* – Vanuatu March 2015, deployment of rapid assessment, initial treatment and rapid response teams to the Cyclone Pam response, treating 1540 patients

**F**ive major deployments were undertaken over five years and underscore the range of activity and capability available to the Australian Government. Deployments were either via the AusMAT mechanism and coordinated by the NCCTRC, or deployed directly by the NCCTRC. These two models offer a substantial degree of flexibility and tailored response to health emergency events. The funding period was bookended by *Operation Pakistan Assist II* in 2010 and *Operation Pacific Assist* in 2015. The former was a successful demonstration of civil-military collaboration in Humanitarian and Disaster Response, during which over 11000 patients were treated by a combined team of clinicians from AusMAT and the Australian Defence Force.

The response to Cyclone Pam in March 2015 was equally unique, this time for the deployment of an AusMAT rapid assessment team with the first Whole of Government contingent arriving in country. This allowed accurate health intelligence and early support to the Vanuatu Ministry of Health which led to the team directly assisting in the coordination of Foreign

Medical Team arrivals. The AusMAT sent as part of *Operation Philippines Assist* represented a substantial achievement in the deployment of the full field hospital capability of AusMAT. During 23 days of operational activity, 2734 patients were seen, 238 operations were performed of which 90 were considered major procedures. The AusMAT hospital was considered a critical hub in the overall emergency health response to the disaster.

Philippines Assist was the first deployment of an AusMAT under the new Foreign Medical Teams framework. At the time it was one of the fastest deployments of a field hospital to a sudden onset disaster. The facility was visited by a number of dignitaries including the President Benigno Aquino of the Philippines and the Australian Foreign Minister, Julie Bishop. As a contrast to this sudden onset natural disaster, the Solomon Islands dengue outbreak in 2012 was far more of a 'slow burn' health emergency. In many ways it was a more challenging response as the local health system struggled under a case burden of over 500 dengue patients per week. Two teams of 9 doctors, nurses and logisticians were deployed by the NCCTRC to embed within the National Referral Hospital in Honiara. The team supported the emergency department in providing routine care whilst Solomon Island colleagues ran a dengue clinic. Several of the key local clinicians had been trained in Darwin during AusMAT courses underscoring the importance of pre-existing relationships in disaster response.

Finally the NCCTRC contributed medical and logistic support to the NT Centres for Disease Control (CDC) in the treatment of indigenous Australians in the East Arnhem community of Maningrida. The training of AusMAT members in remote and austere medicine offered an ideal resource for this critical health program in a context where workforce shortages often compromise service delivery. In addition a number of AusMAT members from the southern states experienced first-hand the realities of remote community life. The partnerships with the local community and CDC are a model for future collaboration in public health response.



## Section 2

# Field Hospital Development and Exercising



### Highlights

- » Development of fully equipped and deployable Type 1 and Type 2 Field Hospitals in accordance with the World Health Organisation "Foreign Medical Team" (FMT) system
- » Leasing a warehouse facility housing the national AusMAT equipment and infrastructure, allowing the NCCTRC to improve response timeliness and efficiency
- » Establishment of a national capability for rapid response to Ebola virus disease to assist regional governments in the event of a suspected Ebola case or other infectious disease outbreaks
- » Ongoing use of local and regional major events as unique opportunities to train AusMAT team members and test the NCCTRC capability

Through the efforts of the former Director of Disaster Preparedness, Dr Ian Norton the NCCTRC had a leading role in the development of the WHO Foreign Medical Team Guidelines and Classification system, published in 2013. This represents a seminal point in International medical emergency response and allows host governments to assess incoming teams against international standards. During this reporting period the NCCTRC has ensured that our national medical response asset is compliant with these guidelines and has constantly worked with our partners in the Commonwealth, most particularly the Australian Defence Force, to reduce activation times and enable timely and efficient deployment.

The AusMAT field hospital now has two operating tables, full resuscitative and trauma capability, as well as a hospital facility capable of managing 100 inpatients. Whilst the field hospital is able to be used in a variety of emergencies, it is primarily a trauma and surgical facility. Following the Ebola virus outbreak in West Africa, the NCCTRC tested the capability of the field hospital to be configured as a temporary, rapidly deployed Ebola Treatment Facility. Subsequent to three successful exercises in late 2014 and early 2015 a stand-alone capability now exists to deploy an AusMAT to an infectious diseases emergency of international significance.

To support the field facility and its water requirements, a new desalination plant was commissioned purifying 10,000L of salt water or 40,000L/day of fresh water. In conjunction with a senior water-sanitation adviser from the International committee of the Red Cross, Mr Robert Handby, our logisticians have substantially developed their WATSAN skills. This ensures that the hospital can be fully functional in meeting the high demands of up to 150 litres of potable water per patient per day.

The human resource requirements of AusMAT have been supported by the roll-out and use of the AusMAT database across most jurisdictions. The NCCTRC has managed and supported the roll-out, and used the platform as a deployment record for the deployments to the Solomon Islands, the Philippines and Vanuatu. The database provides real time access to critical information regarding deployees, their credentials and clinical speciality.

Maintaining staff and equipment readiness is a consistent challenge. To meet this challenge, the NCCTRC identifies major community events where medical, logistical and physical challenges must be overcome to provide the highest levels of patient care. While a number of the exercises have taken place, amongst the most notable are the annual support of the Tour de Timor bike race since 2011. A nation-building event for Timor Leste, the Tour is a unique environment to test deployment capability while building our clinical relationship with the Timorese Ministry of Health. At a local level the NCCTRC is a familiar part of many NT-based major events including the V8 supercars where our teams are on standby to provide high level trauma care. At the close of the reporting period, the NCCTRC has reached a new era in deployment capability and readiness. The rental of a dedicated warehouse allows the NCCTRC to appropriately store, manage and deploy our field hospitals and various logistic pods. The new warehouse has also become a training facility during the AusMAT trainings, our primary display and presentation space, and a R&D laboratory for our logistic capability.

## Section 3

# Royal Darwin Hospital (RDH) and the Trauma Service



### Highlights

- » Accreditation by the Royal Australian College of Surgeons (RACS) as a Level 2 trauma service
- » Incorporation of allied health services into the trauma care model at Royal Darwin Hospital as part of the direct funding and management of the RDH trauma service by the NCCTRC
- » Partnerships with the Australian Trauma Registry and Australian Quality Improvement Program to compile the first National Trauma Registry Report 2014
- » Deployment of AusMAT teams comprising up to 60% of NT based clinical staff
- » Development and implementation of a trauma care model leading to reduced length of stay and improved patient outcomes

Over the decade of its existence the NCCTRC has been both partner and investor in the Royal Darwin Hospital supporting the development of enhanced trauma services and infrastructure. This funding period has seen a more modest investment of 40% of operating funds into the Royal Darwin and Top End Health Services, commensurate with a shifting focus toward building overseas deployment capability and growth in NCCTRC core business activities.

Nonetheless investment remains substantial and has at its core two elements. Firstly, a cohort of 38 FTE clinical, allied, paramedical and support staff that enable RDH to be a trauma receiving hospital are funded by the NCCTRC. These professions include maxillo-facial and orthopaedic surgeons, radiography and laboratory staff and nursing positions. These staff work within clinical units, and many of them have been AusMAT trained and have deployed on behalf of NT Health. They also contribute to day-to-day activities of the NCCTRC as clinical educators and advisors. In particular, the relationship between the Department of Surgery, Critical Care

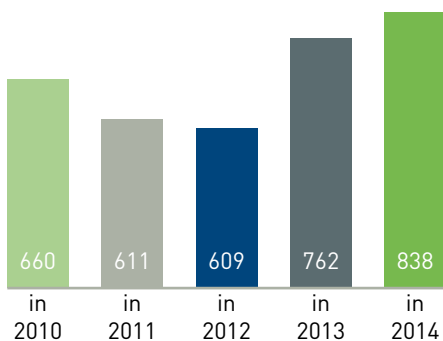
and Anaesthesia has been vital to the successful partnership between RDH and the NCCTRC.

The NCCTRC also directly funds and manages the Royal Darwin Hospital trauma service, a stand-alone unit providing door to discharge holistic care to trauma patients in the Top End. During the funding period the team was granted Level 2 accreditation by the Royal Australian College of Surgeons. Pending the recruitment of a neurosurgeon, we are likely to achieve Level 1 accreditation, equivalent to a large tertiary receiving hospital. The accreditation team observed in their 2013 report that the trauma service had changed the model of care at RDH, decreasing length of stay, decreasing rehabilitation time and the need for rehabilitation.

The Trauma Service has developed a key liaison function engaging with a variety of stakeholders including Careflight and St John Ambulance to improve patient outcomes. Given the NT context of very long distance and travel time, we foster close working relationships with the NT pre-hospital providers to ensure optimal retrieval processes.

Using the data generated from the trauma register, the RDH Trauma Service continues to actively engage in targeted community events and on boards. As an example, we aim for a reduction of car accident related trauma through our involvement in the Northern Territory Football League (NTFL) 'Always wear your seatbelt' campaign, or on the board of KidSafe NT. Injury and burns prevention remain a key community engagement and research focus for the team. Finally the NCCTRC provides a key emergency management function and employs the Territory's main health disaster manager as well as the emergency management officer at the Royal Darwin Hospital. Throughout the past five years these two key positions have integrated the NCCTRC, RDH and Territory-wide emergency plans and ensured preparedness for one of Australia's most disaster-prone regions.

Increase in trauma cases:





## Section 4

# Collaborative Relationships - Domestic Engagement



### Highlights

- » Development of a bilateral agreement with Queensland Health to provide reciprocal medical assistance during disaster and build our core education programs
- » Providing the newly deployed US Marine Corps contingent with medical and heat acclimatisation training relevant to the Top End
- » Finalising the national AusMAT manual in collaboration with jurisdictional and Commonwealth stakeholders
- » Development of a Masters in Disaster Healthcare in collaboration with Flinders University School of Nursing
- » Secondment of senior NCCTRC staff to the NT Government during the responses to Cyclone Lam and Cyclone Nathan February and March 2015



Relationships have been at the heart of the NCCTRC's model of business since its inception. The inestimable value of knowing individuals and agencies in the field and during a disaster has been proven time and time again. Whether through training our colleagues at RSUP Sanglah Hospital who responded to the Denpasar Lion Air crash, or meeting United States marine colleagues on the tarmac of Tacloban City airport, there is no better way to efficiently and effectively respond to disaster than by having a direct relationship with other responders.



At a national level the successful transition was made of our previous relationship with the Princess Alexandra Hospital in Brisbane to a bilateral agreement between the NCCTRC and Queensland Health. This agreement now defines a new level of cooperation in medical disaster response and has been leveraged in the secondment of high level officers to the NCCTRC, the deployment of senior clinical staff to AusMAT exercises, and the support of education programs such as MiMMS.

The publication of the national AusMAT manual was the culmination of years of work moving away from the state-based disaster medical assistance team

model. It was the forerunner for the WHO standards and classification guidelines for Foreign Medical Teams and set the framework for the deployment to Operation Philippines Assist. The lessons learned from that deployment led to the re-convening of the national AusMAT Working Group under the auspices of the National Health Emergency Management Subcommittee (NHEMS) and the AHPPC. The NCCTRC has been a coordination focal point for the future strategic development of AusMAT, and the representation by the NCCTRC on these key national bodies creates the interface between the operational and strategic aspects of health emergency response and the development of the national asset.

The two other key government relationships are with Emergency Management Australia and the Department of Foreign Affairs and Trade. These departments, along with the Department of Health, form the backbone of Whole of Government response and work together in the deployment of AusMAT. The NCCTRC has established strong ties with key officials across government through regular engagement and participation in training events as well as domestic and international forums and think tanks in the health emergency response.

The NCCTRC recognises the importance of collaboration in the civil-military space in Humanitarian and Disaster Response. During the funding period delivered specific medical contingent training for the USMC Shock Trauma Platoon and Forward Resuscitative Surgical Suite, conducted a field site visit to Bradshaw Field Training Area and viewed USMC Field Medical capabilities and opportunities for interoperability. This work has continued to support the exercises undertaken between the ADF and the USMC. High level meetings and ongoing interaction between the NCCTRC and the Commanding Officers of 1 Brigade, Northern Command and the US Marine Corps have facilitated the relationship.

## Section 5

# Collaborative Relationships – International Engagement



### Highlights

- » Devising, funding and leading the development of the World Health Organisation Standards and Classification for Foreign Medical Teams published in 2013
- » Developing and implementing a multi-year strategy to introduce Major Incident Medical Management and Support (MiMMS) training with key Pacific partner nations
- » Partnership with the Australian Government for the successful hosting of the East Asian Summit Rapid Disaster Response Workshop in Darwin
- » Advising and collaborating with New Zealand Health to develop New Zealand Medical Assistance Team Training
- » Visit of Susilo Bambang Yudhoyono and Prime Minister Julia Gillard to the NCCTRC in July 2012

### The benefits of a robust international engagement strategy:

- » to enhance the reputation of Australia in the field of response medicine;
- » to enhance the ability of the NCCTRC to deploy internationally through networks and linkages;
- » To enhance the ability of partners to cope with disaster better;
- » To establish international guidelines and norms in disaster response; and
- » To work closely with like-minded organisations as partners, not competitors.

The period represented a period of significant international engagement for the NCCTRC as a key partner and in its own right. Of particular note during the funding period was the development and publication of the WHO Standards and Classification guidelines for foreign medical teams. Led by Dr Ian Norton and Dr Peter Aitken, and with funding support from the Department of Foreign Affairs and Trade, the group of international experts produced this seminal document which is now the basis for a global medical disaster response framework and has been used in several sudden onset disasters. Dr Norton's secondment to the WHO has been

part funded by the NCCTRC. Our collaboration with the NZMAT program has enabled our partners in NZ Health to develop an additional and valuable standing medical capability for the region. During the funding period the NCCTRC has annually supported the NZMAT training program, engaged in multiple co-deployments including the New Zealand-led deployment to the Solomon Islands floods in 2013, and seconded the NZ Health Director of Emergency Management to back-fill the Executive Director role in June/July 2014.

Training activities throughout the region have been a significant means of engagement with national health systems through to local clinics. Through the NCCTRC and drawing on our partners across Australia, the NCCTRC provides training in MiMMS, an internationally recognised medical emergency management frameworks. Key international engagement is found in delivering the MiMMS training to regional partners. The three year program, co-funded by the Department of Foreign Affairs and Trade, aims to transition the core training elements to be independently managed by national health systems with as needed support from NCCTRC. The same funding stream has also allowed key clinicians from Pacific nations to join AusMAT deployees in Darwin-based training programs. Over the funding period 50 colleagues from the Western Pacific have been trained. A further 36 New Zealand, 8 Indonesian and 9 colleagues from a total of 7 countries have joined us for specialist skills training.

The NCCTRC has been an active participant in improving understanding of disaster response frameworks within the region through the Australia-Indonesia Rapid Disaster Response Initiative and the East Asia Summit. Driven by Emergency Management Australia and partner agencies in the region, activities included a rapid disaster workshop in Darwin in September 2013 during which a high level delegation including the head of Indonesia's National Disaster Management Authority, the BNPB (Indonesian National Board for Disaster Management (Indonesian: *Badan Nasional Penanggulangan Bencana*), visited the NCCTRC Warehouse and viewed the field hospital on full display.



# Section 6

## Education and Training



### Highlights

- » Delivery of an average 118 training days per year to 1,073 participants, exceeding its expected KPIs of 81 training days and 695 participants by around 50%.
- » Creation of an AusMAT Advanced Team Leader group and accompanying course to develop a cohort of AusMAT taskforce leaders
- » Development of a training package for Infectious Disease Emergencies of International Significance

Over the past five years the NCCTRC has enhanced its course packages with the objective of training health professionals to manage and coordinate trauma, mass casualty and disaster incidents. The AusMAT suite of courses and Remote Prehospital Trauma and Disaster Care (RPHTDC) are the flagship offerings. Both represent the Centres overall mandate being to prepare staff for an overseas deployment and to enhance the capacity of clinicians in the Territory to manage local emergencies. The NCCTRC supports AusMAT courses across all jurisdictions through either directly managing or providing technical assistance to local coordinators. This model has allowed jurisdictions choice and flexibility and enhanced course development through the ability to trial new techniques. At the conclusion of the funding period over 600 personnel have completed the AusMAT Team Members course Australia-wide. The AusMAT model is unique in that it is an opportunity to test deployment capability as well as educate new team members in a simulated field environment.

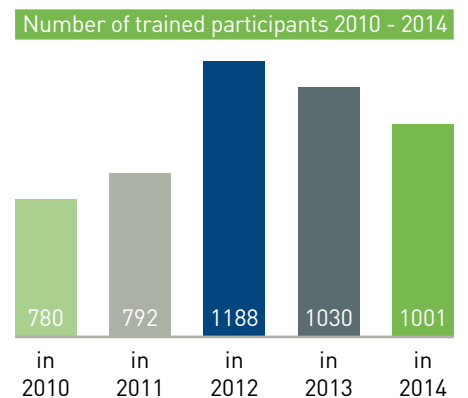
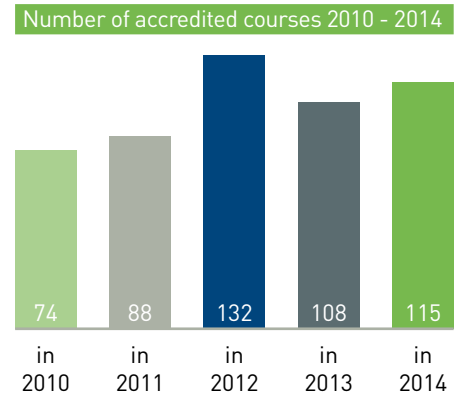
A number of new specialist courses were introduced. The advanced team leader course, which provides specialist skills in leading AusMAT teams, brought together a cohort of senior health planners and operational staff including from the Australian Defence Force.

The Infectious Disease Emergencies of International Significance course, developed by the NCCTRC during the height of the Ebola virus epidemic in West Africa, demonstrated that the NCCTRC field hospital could be configured as a

rapidly deployed Ebola Treatment Facility. The success of this course led to further funding being made available to train 120 AusMAT members to respond to infectious disease epidemics.

The NCCTRC has also focussed on the training of local health personnel in the Northern Territory to respond to mass casualty incidents and the high number of remote multi-trauma events affecting NT communities. These courses are designed to be taken on the road and delivered throughout the Northern Territory. Remote Area Trauma Education (RATE) and RPHTDC (Remote Pre-hospital Trauma Disaster Course) are specifically run in remote health centres while Advanced Life Support (ALS) and Australian Trauma Team Training (ATTT) are delivered in regional centres. Our trainings are appreciated by health professionals as they can update their clinical skills and knowledge in their own environments. In the funding period more than 200 rural and remote clinical staff completed our training packages.

### Education Team Report 2010 - 2014:





# Section 7

## Research



### Highlights

- » Influencing policy and protocols for heat stress in emergency response personnel through translational research
- » Presentation of research data at major national events including Bushfires and Natural Hazards Cooperative Research Centre CRC and the Australasian Fire and Emergency Service Authorities Council AFAC Conference
- » Mentoring researchers from the University of Tennessee and the subsequent development of a deployee well-being monitoring tool for use during AusMAT training and responses
- » Finalisation and presentation of a comprehensive research project analysing a decade of trauma-registry data from the Northern Territory
- » Delivery of thirteen oral presentations at the 2015 World Congress of Disaster and Emergency Medicine

As the NCCTRC has developed its operational capability opportunity has arisen to be performing research in two major domains of our interest.

The well-being of emergency responders in tropical conditions where heat stress is a real and present threat has been the focus of Dr Matt Brearley's work over the past three years. The research has identified that non heat acclimatised emergency responders slow their work rate to limit the development of heat stress, thus supporting the deployment of heat acclimatised responders.

For AusMAT members that are not chronically heat acclimatised, individual

guidelines have been developed to promote adaptation in the home environment prior to deployment, and a subjective well-being tool has been developed to monitor deployees during activations. Both were utilised during 2014 Tour de Timor deployment. These initiatives are in addition to hydration monitoring and field cooling strategies based upon our research. The product of such research is an evidence based system for maximising the health, safety and performance of AusMAT members on deployment. In addition to these ground-breaking results the research platform has enabled collaboration with a number of key partners detailed in table 1. In many instances these partnerships have made real differences to the policies of emergency response agencies, most notably in national fire and rescue services.

The second major area of research interest is trauma and injury. The NCCTRC has invested in staff dedicated to the management of the Top End Trauma Registry. During the funding period the findings of a project examining ten years of data have been released. These have shown the Top End suffers the highest incidence of traumatic injury in the nation at 181 people per 100,000. The outcomes of the project have provoked further research into paediatric trauma, assaults, and the role of geography and seasonal effects of trauma. As well as having important policy implications at community and government level this research allows us to improve and finesse our data collection tools for field-based research during AusMAT deployments. It also allows us to make inferences regarding the success of our trauma service clinical activity which can be directly translated to our management of trauma in the field.

Table 1. NCCTRC research collaborators - Collaborators

QLD Fire and Emergency Services	NT Fire and Rescue Services
ACT Fire and Rescue Services	NT Police Tactical Response Group
NT Police Disaster Victim Identification Unit	NT Emergency Services
Menzies School of Health Research	The George Institute
Charles Darwin University, Northern institute	Charles Darwin University, School of Health
Flinders University, School of Nursing and Midwifery	

## Section 8

### NCCTRC Strategic Plan July 2015 – June 2019

#### Our Vision:

Equipped, Prepared and Ready

#### Our Mission:

Innovate, collaborate and coordinate to deliver Australia's health emergency and medical response capability.

#### Strategic Goals and Key Actions:

**DEPLOY** for sudden onset disaster and medical emergency responses in austere and resource poor settings.

- » Diversify capability and capacity to deploy to a range of health emergencies including public health emergencies.
- » Continually strengthen and support the reduction of activation times.

**BUILD** Northern Australia's surge capacity for trauma and disaster events of significance.

- » Drive the development of a robust, Territory-wide Trauma system.
- » Provide clinical / ancillary staff and infrastructure to RDH to facilitate surge response and readiness.
- » Build capability within the health system to enhance clinical service delivery relevant to trauma and disaster care.

**CREATE** opportunities arising from unique training, research methodologies and content expertise.

- » Develop, protect and promote our unique training methodologies, IT technologies, databases and content expertise.
- » Create a Centre for Operational Research that implements innovative findings to enhance the capacity to deliver patient care and staff wellbeing in the field.
- » Profile, publish and promote Centre deployment, development, training and research capacity to boost relevance nationally and internationally.

**EXCEED** and engage Continuous Quality Improvement practices for internal and external systems and processes.

- » Develop, document and review internal and external Centre clinical and corporate governance reporting mechanisms, systems and processes on a six-monthly basis.
- » Undertake rigorous CQI practices for all activities and exercises to ensure best practice and achievement of key objectives.
- » Strengthen accountability in clinical and corporate governance through adherence to delegations and Centre reporting mechanisms.

**DRIVE** and lead professional standards.

- » Engage in the promotion, implementation and training of standards for disaster medical team deployment in regional and international forums.
- » Deliver operational, tactical and strategic advice on capability and professional standards to Australian Government for all aspects of Foreign Medical Team deployments.

**LEVERAGE** relationships locally, nationally and internationally to enhance medical disaster and health emergency response capabilities.

- » Develop, foster and maintain collaborative and strategic partnerships underpinned by appropriate formal agreements.
- » Build, test and improve relationships with key partners in deployment and trauma care using joint training exercises.
- » Provide national focal point for AusMAT and strengthen working relationships with Australian Government, State and Territory agencies involved in deployment.

**BUILD** a highly skilled and culturally sensitive workforce.

- » Strategically recruit, develop and retain a culturally safe and highly skilled workforce.
- » Implement annual learning programs to create a team and leadership culture across the centre.
- » Build relationships, rapport, share knowledge and limit silos through interactive communication practices and processes.

**SAFEGUARD** ongoing future viability.

- » Constantly explore and examine national and international models of practice for disaster and medical emergency response capabilities to remain "cutting-edge" and relevant.
- » Maximise sustainability through efficient use of resources and sourcing new innovative revenue streams.

## Annex A-B

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**Annex A – Published Articles**

**Annex B – Performance against Key  
Performance Indicators (KPIs)**



## Annex A

### Published Articles

- » Read D, Holian A, Moller CC, Poutawera V(2015). Surgical Workload of an Australian Foreign Medical Team after Typhoon Haiyan. Australian and New Zealand Journal of Surgery. In press.
- » Brearley M, Norton I, Hutton M, Rush D, Smith S, Fuentes H (2015). Urban Search and Rescue Operations in Tropical Climates. In Rumsewicz M (Ed), 'Research forum 2014: Proceedings of the research forum at the Bushfire and Natural Hazards CRC and AFAC conference', 2 September 2014. Wellington, New Zealand.
- » Oppermann E, Spencer M, Brearley M (2015). Emotional Athletes, Brainy Workers and other Hot New Developments: Multiple (re) problematizations of Heat Stress as an object of governance in northern Australia. International Journal of Learning in Social Contexts. 15: 32-39
- » Gowing CJ, McDermott KM, Ward LM, Martin BL (2015). Ten years of trauma in the 'Top End' of the Northern Territory, Australia: A retrospective analysis: International Emergency Nursing. L3(1): 17-21
- » Coatsworth N (2014) The Australian medical response to Typhoon Haiyan. Medical Journal of Australia 201(11): 632-634
- » Brearley M, Norton I, Kingsbury D, Maas S (2014). Responses of Superbike Riders to Racing in Tropical Conditions. International Journal of Sports Physiology and Performance. 9(5): 887-890
- » Walker A, Driller M, Brearley M, Argus C, Rattray B (2014). Cold water immersion and iced slush ingestion are effective at cooling firefighters following a simulated search in a hot environment. Applied Physiology, Nutrition and Metabolism. 39(10): 1159-1166
- » Elgendi M, Norton I, Brearley M, Abbott D, Schuurmans D (2013). Systolic peak detection in acceleration photoplethysmogram measured from emergency responders in tropical conditions. PLoS One 22 8(10): e76585
- » Brearley MB, Heaney MF, Norton IN (2013). Physiological responses of medical team members to a simulated emergency in tropical field conditions. Prehospital and Disaster Medicine 28(2): 139-44
- » Brearley M (2012). Crushed Ice Ingestion – A Practical Strategy for Lowering Core Body Temperature. Journal of Military and Veterans Health 20(2): 25-30

## Annex B

# Performance against Key Performance Indicators (KPIs)

### Performance Indicator 1

Achieved

NCCTRC is ready to respond to a major incident in the region – regional and Royal Darwin Hospital (RDH) emergency management plans, business continuity plans and the NCCTRC Notification and Activation Protocols are maintained and reviewed annually.

**The NCCTRC leads or contributes to the following plans:**

- » NCCTRC Activation Protocol;
- » Greater Darwin Region Medical Group Plan;
- » Executive Leadership Team Business Continuity Plan;
- » Royal Darwin Hospital External Emergency (Code Brown) Plan – Mass Casualties;
- » Royal Darwin Hospital External Emergency (Code Brown) Plan – Tropical Cyclone.
- » Emergency Incident Management System EIMS
- » NT Health Ebolavirus Preparedness Guideline

### Performance Indicator 2

Achieved

Completion of annual assessment of NCCTRC current and future human resources and critical infrastructure surge capacity.

**The NCCTRC monitors human resource requirements on 3 levels:**

- » Internal – NCCTRC FTE requirements and allocations within the Centre are determined as per strategic plan
- » External (NT Health) – NCCTRC funds \$5.7 million, equivalent to 38 FTE, within Royal Darwin Hospital as surge capacity for disaster and mass casualty events
- » AusMAT – NCCTRC governs the AusMAT database and holds the Deputy Chair of the AusMAT Working Group that determines AusMAT Human Resource Priorities

### Performance Indicator 3

Achieved

The number of NCCTRC suitably trained operational personnel with appropriate experience, emergency medicine and trauma skills is equal to or greater than in 2008/09.

Over the 2012-2015 period, the NCCTRC has delivered an average of 118 training days per year to 1,073 participants, exceeding its expected KPIs of 81 training days and 695 participants by around 50%.

### Performance Indicator 4

Achieved

At least one NCCTRC response exercise is conducted annually

In addition to deployments, The NCCTRC employs a living exercise regime that incorporates structured drills and also maximises the learning potential of live activities.

- » Tour de Timor- (2012 / 2013 / 2014) provision of lead medical support and utilised as a training opportunity to test International logistic capabilities
- » Princess Alexandra Hospital Activation Exercise
- » Medical Support to the V8 Supercars Event Darwin
- » Tactical level desktop exercises of the Greater Darwin Region and Royal Darwin Hospital disaster and emergency management plans.
- » Maningrida Trachoma Program April 2012
- » AusMAT Surgical and Anaesthetic Course (18th Aug) – full set-up of AusMAT surgical suite and training of surgeons and anaesthetists in austere medical practice
- » AusMAT Ebolavirus Simulation Exercise (14th Nov) – full set-up of AusMAT field hospital as an Ebolavirus Treatment Unit
- » Tactical Response Group Training and Simulation (1st Dec) – exercise of TRG medic capability subsequent to a field medic training exercise supported by the NCCTRC

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## Annex B

### Performance Indicator 5

Achieved

Collaborative relationships with local, national and relevant health organisations (including response counterparts) are established and maintained to enhance the NCCTRC's role as the northern Australian hub of disaster response. The Department of Health and Ageing is informed and, where appropriate, involved in work with other Australian Government agencies and international organisations or countries.

**The NCCTRC is engaged and partnering with a series of key health organisations and stakeholders:**

- » NZ Health Department of Emergency Management
- » World Health Organisation Global Emergency Management Team
- » ASEAN Military Medicine Group
- » Queensland Health Counter Disaster Unit
- » 1 Brigade Australian Army
- » Northern Command, Australian Defence Force
- » US Marine Corps
- » Australian Trauma Quality Improvement Program (AusTQUIP)
- » Sanglah Hospital, Bali
- » Ministry of Health, Timor L'este
- » Flinders University School of Nursing
- » World Association of Disaster and Emergency Medicine
- » Pasifika Medical Association
- » State and Territory AusMAT jurisdictional focal points

### Performance Indicator 6

Achieved

NCCTRC provides input into the development and review of national response protocols.

As part of core business activities the NCCTRC maintains membership of committees/working groups that may attribute to the review of national response protocols and contribute to relevant policy development. In addition the NCCTRC conducts research activities that upon publication can influence or better inform national response protocols decision making processes.

**Working Groups:**

- » AusMAT working group and subcommittees

**Committee membership:**

- » AHPPC (Australian Health Protection Principal Committee) – Member
- » NHEMS (National Health Emergency Management Standing Committee)
- » AusMAT Working Group – Deputy Chair
- » MIMMS (Major Incident Medical Management and Support) - Member and Secretariat
- » DSTC (Definitive Surgical Trauma Course) Instructor & Sub-Committee
- » CENA (College of Emergency Nursing Australasia) Senior Trauma Nursing Program Coordinator
- » AusTQUIP Trauma Quality Systems Working Group member
- » SJA (Saint Johns Ambulance) NT Quality & Clinical Governance Committee member

- » GDRMG Greater Darwin Region Medical Group
- » AusTQUIP Steering Committee member
- » RACS Vice Chair of Military section
- » RACS Disaster Preparedness Sub-Committee member
- » RACS Trauma Committee NT Regional Chair
- » RACS Senior EMST Instructor & Director
- » RACS Senior EMST Coordinator
- » RACS Trauma Verification Sub-Committee
- » RACS Member Trauma Verification Site team
- » RACS EMST ADF Board member
- » RACS Trauma Verification sub-committee

### Performance Indicator 7

Achieved

As a member, participate with the Australian Government Department of Health and Ageing and other jurisdictions on the Australian Health Protection Committee and that National Health Emergency Management Sub-committee to ensure a consistent, strategic and effective response to national health emergencies

The NCCTRC has a 100% attendance and participation at both AHPPC and NHEMS.

### Overall project budget (in \$ 000)

2010-11	2011-12	2012-13	2013-14	2014-15	TOTAL
14 212	14 481	14 756	15 007	15 307	73 763