Senate Inquiry into Recent Trends in and Preparedness for Extreme Events

Submission from Dr Sandy Donald

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Background:

1. I have been resident in Cairns since 1995, experiencing a number of cyclones of varying intensities.
2. I work at Cairns Base Hospital (CBH) as an Anaesthetist/Intensivist. In this role I was in charge of the Intensive Care Unit throughout cyclone Larry.
3. I have been Union representative for many of the staff. In this role I have tried to improve safety and transparency of disaster responses, and to find answers to the many questions members of staff felt were never adequately addressed.
4. My comments are mostly related to cyclones and storm surge.

(b) (i) projections on the frequency of … storm surge

My particular concern here is the assessment of current risk on which future projections are based.

Following cyclone Yasi numerous statements were made by Queensland Health and the Qld government about the risks of particular storm surge levels. These all appear to be sourced from a document entitled "Cairns Base Hospital Storm Surge re-assessment" (SSR)[i] (specifically from Table 4.1).

This data in turn appears largely based on the "Ocean Hazards Assessment"[ii] In Stage 3 it is noted that data from 33 years (1969-2001) was used as input to a computer model to create a "large ensemble of synthetic tropical cyclones" representing 3000 years of storms. While this was presumably the best data available at the time (and I acknowledge that there may other significant inputs of which I am unaware), there must be an enormous degree of uncertainty in the predictions.

There now exists an alternative method to assess storm surge recurrence risk. Paleotempestology uses geomorphic evidence (such as ridges of shell and coral detritus) to determine the level of marine inundation events over the past 5000 years, and produces dramatically different estimates.[iii] What is currently quoted as a 1:3000 year event (storm surge reaching the ground floor of CBH) may in fact be a 1:100 year occurrence **before** global warming is considered.

While I have no qualifications in this field, when I see two expert opinions that are so widely divergent I am concerned that only one has apparently been considered.

The importance of this risk assessment lies in the level of effort and expenditure directed to preparation and planning for storm surge events at all levels from individuals to federal government.

(c) preparedness of … telecommunications

Redlynch is a peripheral Cairns suburb which loses electrical power far more often than the inner suburbs, and has repeatedly lost power for several days after cyclones (e.g. Justin 1997, Larry 2006, Yasi 2011).

In 1997 the telephone service continued unbroken (using a corded phone). In 2006 the phone line went dead about 6-8 hours after the power failed, and after Yasi lasted only slightly longer. In other words with no infrastructure damage the phone worked only until the battery backup in the local exchange ran out. Some parts of Redlynch had a mobile phone signal, but this was very variable.

It is unclear to me whether Telstra has any obligation to maintain telephone services in the event of electrical power outage without infrastructure damage. In particular it seems that an exchange that used to have a generator to back up the batteries failed in 2006 and 2011 due to lack of generator power – well after winds had subsided and it was safe to move around.

Telephone communication remains a critical need:

1. For those with medical conditions or disabilities
2. To notify of emergency needs (especially injuries or acute illness) in the post-event period when helicopter may be the only means of access

At the very least it should be clear to subscribers in what circumstances their exchange is planned to fail.

(c) preparedness of … health

The evacuation of the Cairns Hospitals - CBH and Cairns Private Hospital (CPH) - demonstrated both significant strengths and fatal weaknesses of Queensland's Health response to extreme events.

1. Evacuation of CBH

The successful evacuation and decommissioning of CBH (and CPH) in under 24 hours was an extraordinary achievement, especially given the need to fly over 300 patients 1700 km to Brisbane. Many individuals (and organisations) achieved extraordinary things under enormous pressure, and many have been recognised for this effort.

What has been largely overlooked were the very many "opportunities for improvement" and, more importantly, the reasons behind them.

2. Decision-making

While staff and the public have been repeatedly told the decision to evacuate was made by the Chief Health Officer (CHO), she has reported that the decision was made by the Premier.[iv] This is not surprising in the circumstances of a high-threat high-publicity extreme weather event.

Planning for evacuation began when the Premier announced in her 9:30 press conference "we are now looking very seriously at an evacuation of Cairns Base Hospital". Explanations for this decision have been inconsistent and contradictory, undermining confidence of locals in future decision-making and denying an opportunity to learn critical lessons.

Had staff been told "the Bureau of Meteorology (BoM) is predicting up to 5m of water through the hospital" or "two hospital blocks could fall down with a 5m storm surge" there would have been less questioning of the decision itself.

It is important to note that the Premier's announcement effectively committed various agencies to assisting the evacuation and made complete evacuation possible. A key point in any evacuation decision is the point at which evacuation becomes impossible to complete safely.

In the future the a decision is more likely to be made locally, which increases the importance of a clearly documented decision process – otherwise resources required may not be provided.

3. Evacuation Plan

At the time of the decision to evacuate CBH there was no evacuation plan or any plan to set up an alternative facility to provide more than first aid. That there was a functioning health facility - the Fretwell Emergency Centre (FEC) - was available during Yasi is an extraordinary achievement, and I do not wish to criticise those who created a plan from nothing.

The significant risk to physical and mental health of those who worked at FEC, and the inability to adequately provide an acceptable standard of care to some patients is largely due to the an adequate plan.

The absence of a plan is particularly inexcusable given the specific recommendation in SSR that "The Hospital should develop and maintain an evacuation plan". While CBH has now finally developed a draft plan that should make any future evacuation less chaotic, it is incomplete. Developing a plan to identify, prepare, staff and stock an emergency medical facility in a disaster is a highly specialised task. Surely there should be a federal agency that can assist a Health Service to modify a pre-existing template to suit local conditions, and then check for obvious omissions.

4. When to evacuate

A considered decision to evacuate requires knowledge of the threat, and of its likely impact on relevant structures. SSR thus recommends "that a risk assessment audit of the exisiting hospital facilities be undertaken…".

A "Cyclone Resilience Study" of CBH was released to staff in the past week [attached]. This document not only provides critical information about the risk to hospital buildings from wind or storm surge. It also provides very useful explanations of terms used both in an engineering assessment, and those used by the BoM.

Critical engineering terms that could be misinterpreted are "building envelope" and "structural failure".

Confusion with BoM information occurs primarily around HAT (Highest Astronomical Tide), AHD (Australian Height Datum), and "above normal tides", and relating that information to ground floor level of a building. Knowing how far the predicted storm surge could be above ground floor (or second floor) level is critical both in decision making, but also in convincing others that the decision is sensible.

I am doubtful that any other hospital in Australia has such a detailed and helpful assessment of building risk in a cyclone, however I believe every hospital in a cyclone risk area should have something similar.

5. Where to evacuate

That FEC was an inappropriate building has been acknowledged. With the equipment available it was not possible to safely perform life-saving surgery (especially caesarean section), and the building was inappropriate in Category 5 winds.

While the CBH draft evacuation plan lists three alternative facilities, none have been assessed for safety in a Category 5 cyclone. Seven years since cyclone Larry and two years since cyclone Yasi there is no Category 5 cyclone shelter with provision for health care, and currently no plan to fund construction of a building that would be safe for health services during such a storm.

Cairns – and in particular CBH - is not adequately prepared for a Category 5 cyclone.

6. Why not to evacuate

Evacuation of a major hospital – and in particular the only major hospital for a large and isolated region – is high risk.

a. Transport of critically ill patients can kill them, but sedating for transport patients who are nearly off the ventilator can set them back substantially. Interruption of treatment (whether medications or mobilisation) can equally have adverse effects, and transport of premature babies carries a significant risk of infection. It is not clear that any attempt was made to identify excess mortality or morbidity in those patients evacuated, or to quantify likely risk for a future evacuation.
b. Loss of services: taking all health services out of Cairns for 48 hours or more risks several deaths. Trying to provide services without specialised kits for disaster medicine is dramatically inferior to what can be done in a hospital. A complete evacuation needs to take into account the risk of avoidable bad health outcomes
c. Unsafe destination: neither FEC nor any currently identified Alternate Facility is designed for a Category 5 cyclone. It is entirely possible that staff will be moved to a less familiar and suitable building where they are less safe. The same is true for patients moved to another hospital which has not had a formal "Cyclone Resilience Study"

7. Staffing

Since Yasi, CBH has developed a new "Template Notification of a Disaster" which contains the following statement: "**Please note that any staff member who believes they need to leave**

the workplace immediately in order to protect themselves, their family, or their property is <u>entitled</u> to do so."

In previous cyclones, and in particular prior to Yasi, some staff were prevented from leaving work at a time they (and possibly their manager) believed it appropriate. There were media reports of resort island staff not being given an opportunity to evacuate, and I have been told of offices in other departments not being allowed to evacuate in the face of flooding until permission was received from head office. CBH has learned and acted on that important lesson, but

Allowing staff to leave further highlights the problem of identifying staff to provide services in a disaster. The best summary of the evacuation to date[v] acknowledges this unresolved problem. A structured mechanism to identify requirements and allocate suitably qualified volunteers is a critical requirement.

In summary, Cairns has learned some of the lessons, but cannot necessarily implement the solutions. It is unclear whether any of these lessons have been passed on to other employers and service providers.

(d) adequacy of resources

Clearly at Fretwell Emergency Centre resources were inadequate. While a better plan might ensure enough surgical instruments, IV lines and the ability to warm a newborn baby, it seems illogical to expect each hospital to maintain stocks of ration packs, bottled water, and other items specific to a major incident. Something as simple as a tent on the basketball court would have given some privacy and protected an open wound from falling dust and animal faeces when winds were high.

Assistance with setting up an Alternative Facility (or preparing a hospital to run for three or four days without re-supply) should logically involve assistance with both consumables and planning from an expert in the field. This would allow hospital staff to deal with the areas in which they are expert, while also minimising the need to carry infrequently needed special stores.

(e) division of responsibilities

As states have responsibility for delivery of hospital care it seems logical that they should be responsible in the first instance for providing health care in a major weather event. I am concerned that there appears to be little federal oversight or setting of minimum standards

After an event as significant as the evacuation of the only hospitals in a city the size of Cairns it would seem logical that an expert would at least supervise a review of the major events, assist with tabulating important lessons for dissemination, and upgrading plans where necessary.

Instead, plans to employ an expert in disaster planning were shelved (presumably due to cost and lack of financial assistance), the Debrief became the only effective review, and a single Admin officer was left to almost single-handedly produce an Evacuation Plan.

I believe a Federal agency needs to take responsibility for reviewing Risk Assessments, Disaster Training, Evacuation Plans and other relevant documents against published templates to ensure relevant issues are covered

This seems even more critical after Queensland Health's Emergency Management Unit ceased to exist with most of those with qualifications or expertise given redundancies. It would appear that Health Services are now left to decide how much of their dwindling funding they will spend on preparing for something that might not happen – and in which they have no expertise.

(h) any related matter

Provision of disaster-related information to staff and the public well in advance of an event allows proper examination and discussion of the evidence and plans.

Members of staff who are aware of the plans and the reasons for them are far more likely to have considered how they might respond and therefore be far more resilient in the face of a major event.

Unfortunately politics and bureaucratic control tend to restrict knowledge of and access to documents. The May 2007 Storm Surge Reassessment is a good example. It contained important information and critical recommendations, but was kept secret until after the final decision not to relocate the hospital was announced.

There need to be standards that require publication of essential information (such as a Hospital Cyclone Resilience Report), and that such a report is written in a way that makes correct interpretation of the information contained likely.

Finally, I note that the only major public hospital in a cyclone prone area can meet current building standards without having a designated "place of safety" in a Category 5 cyclone.

In order to provide options in the event of a high-category storm it would seem logical to investigate requiring buildings above a certain size to have a protected core where people can shelter.

It would also seem logical to require any large population centre to have at least one designated structure where essential health care can be provided during and after a cyclone that is reasonably likely to affect that area.

I don't believe that careful examination of the best current evidence would conclude that Cyclone Yasi was truly a "one in a thousand year storm"

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[i] Cairns Base Hospital Storm surge re-assessment, Department of Public Works May 2007. http://www.parliament.qld.gov.au/documents/tableOffice/TabledPapers/2008/5208T4780.pdf

[ii] Queensland Climate Change and Community Vulnerability to Tropical Cyclones http://www.longpaddock.qld.gov.au/about/publications/vulnerabilitytocyclones/index.html

[iii] Letter to the Editor: Comment on the Paper 'Quantifying Storm Tide Risk in Cairns' by Ken Granger http://www.tesag.jcu.edu.au/staff/jnott/abstracts/Cairns%20storm%20tides%20(Nat%20Haz).pdf

[iv] Weather to evacuate? Comment. Med J Aust. 2012 Jul 2;197(1):27-8.

[v] The Evacuation of Cairns Hospitals Due to Severe Tropical Cyclone Yasi. Acad Emerg Med. 2012 Sep;19(9):E1088-98