

# “They just don’t like to wait!”

*A comparative study of Aboriginal and non-Aboriginal people who do not wait for treatment or discharge themselves against medical advice from rural emergency departments*



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## Definitions

- **Aboriginal** - Aboriginal people in this study refer to people who have identified themselves as either being of Aboriginal or Torres Strait Islander origin.
- **Australasian Triage Scale** - throughout Australia and New Zealand the Australasian Triage Scale is used to rate clinical urgency as the triage nurse asks the question “this patient should wait for medical assessment and treatment no longer than.....”
- **Did not wait** – refers to a person who leaves the emergency department prior to being seen by the medical officer or before commencement of treatment.
- **Discharge against medical advice** – refers to a person who leaves the emergency department prior to completion of treatment and against the advice of the medical officer
- **Triage** – is a dynamic process whereby patients presenting to emergency departments are prioritized according to their presenting condition in an attempt to regulate the flow of patients and identify clinical urgency

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## Executive Summary

Aboriginal people presenting to emergency departments face unique experiences. This group is consistently over reported in urban data looking at those people who either did not wait to see the medical officer or discharged themselves against medical advice from emergency departments. The anecdotal explanation of this phenomenon given by health professionals is that “they just don’t like to wait”. This is however, a simplistic and complacent view of a significant and complex issue. With limited data to work with it is likely that there are other indisputable significant factors that impact on their decision to leave, and the picture that emerges in the literature indicates that there are multiple factors that influence this decision.

To date there is insufficient information from rural and regional areas to know if the trend reported in urban areas is replicate. If, however, a decision to leave prior to commencement or completion of treatment is made in a rural community there is often limited or no choice for alternative after-hours health care arrangements, leading to potential adverse outcomes for this vulnerable group.

We already know that Aboriginal people suffer more ill health than non-Aboriginal Australians, resulting in higher hospital admission rates, longer inpatient stays, and more complex health problems (Australian Institute of Health and Welfare, 2005, and Anderson, et al., 2002). A number of studies show that Aboriginal people are estimated to attend emergency departments twice as often as non-Aboriginal people (Thomas & Anderson, 2006; National Aboriginal & Torres Strait Islander Health Survey, 2005), and urban studies indicate that they are 28-54% more likely to leave before being seen by the medical officer (Mohsin, 2002; Turner, 1995; Green 1998).

Once admitted to hospital Aboriginal people discharge themselves from hospitals against medical advice at up to 19 times the rate of other Australians (Australian Institute of Health and Welfare, 2006). Data from urban emergency departments describe the rate of discharge against medical advice at between twice and three times that of non-Aboriginal people (Green, 1998; Turner, 1995), and Aboriginal males aged 25-44 years discharge against medical advice at 20-30 times the rate of other Australians (Green, 1998; Turner, 1995, Australian Hospital Statistics 2005-2006). Green (1998) and Turner (1995) argue that this disproportionate rate of discharge against medical advice and did not wait provides indirect evidence of the extent to which hospital services are not responsive to the need of Aboriginal people. They go on to suggest that there are significant issues in hospitals responsiveness to the needs and perceptions of Aboriginal people that allow these continuing high rates.

This comparative descriptive study examines Emergency Department Information Systems (EDIS) data to monitor demographic patterns of Aboriginal people who utilise emergency departments in the North Coast Area Health Service (NCAHS) of New South Wales in a twelve month period from the 1st of January, 2006 to the 31st of December, 2006. It adds to current knowledge by providing a rural perspective on Aboriginal people who leave the emergency department either prior to commencement or completion of treatment. The Aboriginal and Torres Strait Island Research Agenda Working group (2002) undertook an extensive consultation process which produced the Strategic Framework for Improving Aboriginal and Torres Strait Islander Health through Research. The framework identified six research themes

for achieving substantial health gains for Aboriginal people. This research uses two of these themes, firstly by producing descriptive research that will provide information, and secondly, by producing health service research which is aimed at improving the quality of service offered in emergency departments across the NCAHS.

## **Aims**

Using Emergency Department Information System Data (EDIS) from four hospitals in the North Coast Area Health Service (NCAHS) during the period of 1<sup>st</sup> of January, 2006 to the 31<sup>st</sup> of December, 2006 this study aims to:

- Examine the relationship between the variables did not wait and Aboriginal status
- Examine the relationship between the variables discharge against medical advice and Aboriginal status
- Explore relationships between the assignment of the Australasian Triage Category and the variable Aboriginal status.

## **Findings**

This study revealed that:

- Aboriginal people were 1.5 times more likely to leave emergency departments in Port Macquarie, Kempsey, Coffs Harbour, and Grafton hospitals prior to being seen by the medical officer than non-Aboriginal people.
- Aboriginal people presenting to emergency departments at Port Macquarie Base hospital and Kempsey District hospital are 2.5 times more likely to discharge against medical advice from the emergency department than non-Aboriginal people.
- Descriptive analysis revealed that those Aboriginal people who do not wait to see the medical officer were more likely to be young children or young adults, female, had arrived by ambulance, had presented on a Monday, Tuesday, or Sunday, and had presented during the early evening or afternoon.
- The study supported the correlation between triage categories and did not wait finding that the majority of Aboriginal patients, who left the emergency department prior to being seen by the medical officer had been triaged a category 4 or 5. The study revealed Aboriginal people triaged to category 4 were 4.6 times more likely to leave prior to being seen by the medical officer than those triaged to category 5. Those people triaged to a category 4 are considered to have a potentially serious condition, rather than those triaged to category 5 who are said to have a less urgent condition.
- Of concern was the percentage (15.9%) of Aboriginal people who did not wait who had been triaged as a category 3. Those people triaged to a category 3 have been assessed as having a potentially life-threatening condition requiring treatment within 30 minutes.
- There was very strong evidence to support a difference in the number of Aboriginal people triaged as a category 3 at Port Macquarie Base hospital who did not wait to see the medical officer (n=13) when compared to non-Aboriginal people. Aboriginal people in triage category 3 were 2.7 times more likely to leave prior to being seen by the medical officer or commencement of treatment than non-Aboriginal people at this facility. This results in people with potentially life threatening conditions leaving the

emergency department prior to seeing the medical officer.

- Analysis of triage category distribution at all four sites revealed no relationship difference between triage category assignment and Aboriginal status.

## **Recommendations**

To achieve the NCAHS goals of creating a better experience for Aboriginal people using health services, it is proposed that the NCAHS adapts a range of options including:

- Formation of partnerships with local Aboriginal communities to identify barriers and improve access and cultural safety in emergency departments.
- Implementation of simple measures such as smoking ceremonies, and the acquisition of local Aboriginal art for the emergency departments in the area.
- The formation of a closer liaison with local Aboriginal Medical centres to provide further and more appropriate primary care options for Aboriginal people.
- Continued monitoring of Aboriginal people utilising emergency departments in the NCAHS including did not wait and discharge against medical advice rates to ensure improvement in efficacy, access, and outcomes.
- Urgent investigation into the disproportionate number of Aboriginal people from category 3 at Port Macquarie Base Hospital who did not wait.
- In the interim, notification and involvement of the Aboriginal Liaison Officer at both Kempsey District Hospital and Port Macquarie Base Hospital in all transfers of Aboriginal people to assist with support for personal and social issues that may impact on Aboriginal people's decision to leave prior to being seen by the medical officer.
- Investigation into the phenomena of discharge against medical advice at both Kempsey District hospital and Port Macquarie Base hospital specifically looking at morbidity, and adverse outcomes for this group.
- The provision of culturally appropriate information regarding triage to be supplied to all Aboriginal people.
- The provision of culturally appropriate information regarding discharge against medical advice acknowledging lack of alternative health options and encouraging people to return to emergency departments if required.
- Review of current allocation of resources to emergency departments, in an attempt to match allocation of resources to periods of high patient volumes in the emergency departments.

It is acknowledged that these recommendations have been formulated prior to consultation with local Aboriginal communities and improvements in our health service can only be achieved by the formation of partnerships with the local Aboriginal communities. Currently the formation of a working party between Durri Medical service and Kempsey emergency department is underway.



## **Preamble**

This study presents a rural perspective on Aboriginal people utilising emergency departments in the North Coast area of New South Wales in Australia. Firstly, it provides a literature review of the current available information regarding Aboriginal people interfacing with Australian emergency departments, specifically investigating the phenomena of did not wait and discharge against medical advice. Urban studies are reviewed and examined to paint a picture of the current problems and issues encounter by this group. Next, possible causes including cultural clashes, racism, and the socio-economic influences of ill health are discussed. The study then examines data from four hospitals in a rural area to provide a rural perspective on these problems. Finally, recommendations are presented to improve access by Aboriginal people to rural emergency departments.

## **Introduction**

It is well documented that Aboriginal people suffer more ill health than non-Aboriginal Australians (National Aboriginal & Torres Strait Islander Health survey, 2005), resulting in higher hospital admission rates, longer inpatient stays, and more complex health problems (Anderson, et al, 2002). A number of urban studies conducted show that Aboriginal people are estimated to attend emergency departments twice as often as non-Aboriginal people (National Aboriginal & Torres Strait Islander Health Survey, 2005; Tomas & Anderson, 2006), and are 28-54% more likely to leave before being seen by the Medical Officer (Mohsin, 2002., Green, 1998., Turner, 19995).

Once admitted to hospital Aboriginal people discharge themselves from hospitals against medical advice at up to 19 times the rate of other Australians (Australian Institute of Health and Welfare, 2006). Emergency department data describes the discharge against medical advice (DAMA) rate at between twice and three times that of non-Aboriginal people (Green, 1998., Turner, 1995), with Aboriginal males aged 25-44 years likely to discharge against medical advice at 20-30 times the rate of other Australians (Australian Hospital Statistics 2005-2006). Some argue that the discharge against medical advice and did not wait rates provides indirect evidence of the extent to which hospital services are not responsive to the need of Aboriginal people, suggesting that there are significant issues in the responsiveness of hospitals to the needs and perceptions of Aboriginal people (Green, 1998., Turner, 1995).

People who leave the emergency department prior to being seen by the medical officer remain important in terms of risk management as it is not yet understood whether clinical outcomes and subsequent morbidity are compromised in this group. Often in rural communities the emergency department provides the only health care option on weekends and after-hours, creating a situation whereby this vulnerable group of people are left with no alternative health care options.



## Aims of the Study

This is a comparative retrospective cross sectional study that examines Emergency Department Information Systems (EDIS) data to describe trends in the demographic patterns of Aboriginal people who utilise rural emergency departments in the NCAHS. The aims of this study are to provide a rural perspective by:

- Examining the relationship between the variables did not wait and Aboriginal status
- Examining the relationship between the variables discharge against medical advice and Aboriginal status
- Describing the relationships between Aboriginal status and assignment of triage categories.

## Background

Emergency departments most often provide the first impression to the public of their health service, and have been identified as a key determinant of a hospital's reputation. Fernandes 1994, Oakland 1989, Thomson et al, 1996 in supporting this view point out that the perception of quality care in a hospital by the community is dependent on experiences in the emergency department (as cited in Mohsin, 2002). Thomas and Anderson (2006), contend that regular monitoring of emergency department data has the potential to improve care provided to Aboriginal people. Otim, Anderson et al (2001) support this believing that it is critical to *understand patterns of utilisation and the dynamics that shape it* in order to develop strategies that will improve access to hospitals by Aboriginal people. The NCAHS Aboriginal & Torres Strait Islander Health and Well Being Strategic Plan (2008-2013 Draft) and the North Coast Area Service Plan (2005-2010) have identified goals of improving access to health services, and improving the social and emotional well being of Aboriginal people as key priorities. By investigating the way in which Aboriginal people use emergency departments in the NCAHS it will be possible to explore the interface that occurs between this population and the Area Health Service, providing information to improve access and service.

### **What we already know about the interface between Aboriginal people and Emergency departments.**

The majority of emergency departments in NSW are located in rural areas, and vary both in size and services provided (NSW Emergency Services Plan, 2001). Previous studies exploring the distinctive characteristics of Aboriginal people using emergency departments have been predominately conducted in large urban centers in the Northern Territory, Queensland, and one large multi-centre study in NSW (Green, 1998., Mohsin, 2002., Lee et al, 2004., Johnston-Leek, et al, 2001). A literature review conducted by Thomas and Anderson (2006) located only two studies exploring the use of health institutions by Aboriginal people in rural or regional areas. Turner (1995) produced one of these studies describing Aboriginal utilisation of hospital and rehabilitation services in the Shoalhaven district. Another older study conducted in 1975 by Kamien examined Aboriginal access to health care services in rural New South Wales. Kamien's (1975) classic work "The Dark People of Bourke" exposed a *cultural chasm* between health care providers and the Aboriginal people of Bourke in the 1970s. Although

these two studies have a rural perspective they are not in the specific context of accessing emergency departments (Thomas & Anderson, 2006), and now may be considered somewhat dated as health institutions within Australia have hopefully moved on from the 1970 chasm described by Kamien.

To date studies relevant to the way in which Aboriginal people interface with emergency departments have been conducted in large urban centres, creating a situation where by information and recommendations based on urban models are moulded to fit rural areas. As Brand, Kennedy et al (2005) conclude there is inadequate information at this time to draw conclusions on those Aboriginal people who leave emergency departments prior to being seen by the medical officer in regional and rural areas.

### **Why the special focus on Aboriginal people in the Emergency Departments?**

The settlement of Australia by Europeans has resulted in an undeniable adverse impact on Aboriginal people, stemming from dispossession, and loss of culture (Australian Institute of Health and Welfare, 2006). One of the most obvious impacts has been on the health status of Aboriginal people which is supported by well documented evidence that Aboriginal people suffer poorer health outcomes when compared to other Australians (Australian Institute of Health and Welfare, 2006). These poor health outcomes are most dramatically expressed in a significantly shorter than average life span, with life expectancy at birth for Aboriginal people estimated at 17 years lower than non-Indigenous Australians (Trewin & Madden, 2005., Australian Institute of Health and Welfare, 2006). Duckett (2004) describes the health status of Aboriginal people as “appalling” supporting Dr Michael Wooldridge in his role as Commonwealth Minister for Health in 2000 who acknowledged that our single most spectacular failure as a nation has been in the area of Aboriginal and Torres Strait health (Australia Health, 2000). The Cooperative Research Centre for Aboriginal and Tropical Health (2003) supports this view describing Australia’s performance in achieving health outcomes for Aboriginals and Torres Strait Islanders as disappointing despite Australia’s general health and wealth.

The relationship between ill health, socioeconomic status, and employment, is well recognised with those from lower socioeconomic groups experiencing more illness (Australian Institute of Health and Welfare, 2006., Australian Bureau of Statistics, 2005., McClelland & Scotton, 1998; House, 2001; Hayes, Quine, Taylor & Berry 2002 as cited in Duckett, 2004). Aboriginal people are disadvantaged across a range of indicators of socioeconomic status including income, employment, educational outcomes, and housing (Australian Bureau of Statistics, 2005., Australian Institute of Health and Welfare, 2005), with an estimated 50% of Aboriginal people in New South Wales (NSW) currently unemployed (Trewin & Madden, 2005). The Australian Institute of Health and Welfare (2006) however, conclude that measurements of socioeconomic status do not alone explain these poor indicators of health for Aboriginal people.

Indicators of poor health and low socioeconomic status for Aboriginal people are well documented and discussed. It seems despite the implementations of numerous policies and programs the health status of Aboriginal people has shown little improvement over several decades, as demonstrated by a shorter life expectancy which has remained relatively static.

As Winter (2002) notes the principal difficulty does not lie in assembling overwhelming evidence either legal or numerical to quantify the problems of Aboriginal health but rather the poor focus on improving health conditions. It is acknowledged that many of the determinates of poor health outcomes in Aboriginal people are linked to social and economic factors that are well beyond the control of current health care systems (Henry, Houston, & Mooney, 2004., Smylie, Anderson et al 2006). Health services do, however, have control over improving access and delivery of services including those offered by emergency departments to improve health outcomes for Aboriginal people.

### **Accessing mainstream health services, different culture, different experiences?**

Smylie, Anderson, et al. (2006) highlight the impact of capacity and effectiveness of healthcare systems on Aboriginal health. Aboriginal people may however, experience difficulty in accessing and utilising main stream services. Maher (2002) suggests that the cultural differences between mainstream health systems and Aboriginal culture often result in difficulties in both access and delivery of care, citing cultural barriers as an important factor in restricting access to health services.

Eckermann, Dowd et al. (2006) believe that health care delivery in Australia is often insensitive and inappropriate for Aboriginal people, resulting in reluctance to utilise mainstream health services. Ivantiz (2000) examined the phenomenon whereby Aboriginal people, despite their close proximity to mainstream health, services continue to have poor health outcomes. She suggested that the emphasis on the “biomedical” models of health may be culturally inappropriate or difficult to access. Thomas and Anderson (2006) summarise cultural barriers to those including poor literacy, linguistic barriers, different constructs of health and sickness, racist service providers, unavailability of Aboriginal, or gender appropriate staff and the lack of concern by providers for the role of the patient’s family in healing.

The NCAHS Service Plan (2005-2010) has identified that equity in health is about “ensuring fair and just access for everyone for opportunities for health”. The NCAHS acknowledges that not everybody has the same level of resources or health to deal with their health problems, suggesting different responses are required to work towards equal outcomes in terms of health for all its consumers. The question that therefore remains is how to improve access to mainstream services for Aboriginal people. Cultural barriers and racism have been identified as major determinants in accessing mainstream services. So is racism real or simply a misunderstanding of “institutional mystique” that surrounds the process of accessing emergency departments?

### **Racism: perception or reality?**

Kerridge, McPhee et al. (2001) argue that racism is a feature of the Australian health care system despite the lack of any studies to support or refute this. They suggest that racism has been a predominate feature of Australian history, and continues in health at both a macro and micro level reflecting social attitudes. This belief is supported by Henry, Houston et al. (2004) who believe Australian healthcare facilities are institutionally racist and that this represents one of the greatest barriers to improving health of Aboriginal people. Institutional racism according to Paradies, Harris, and Anderson (2008) is the requirements, conditions, practices,

policies, or processes that maintain and reproduce avoidable and unfair inequalities across ethnic/racial groups Institutional racism in Australian health care is demonstrated in several recent studies looking at access to care and treatment which have shown that the rate of percutaneous coronary interventions for Aboriginal people is 39% lower than the rate for non-Aboriginal people, (Coory & Walsh, 2005), and that the rate of kidney transplants for Aboriginal people is one third that of non-Aboriginal people (Cass et al 2004).

Larson, Gillies, Howard, & Coffin (2007) suggest that institutional racism in its covert and subtle way is most often not recognized by those involved. Fisher and Weermanthis (2002) argue that disparities are more likely a result of subtler systemic practices, not ill-intentioned but still discriminatory, and almost invisible within an individual patient-provider encounter. A recent study by Larson, Gillies, Howard, & Coffin, 2007 revealed that more than 40% of Aboriginal people had experienced negative racial based treatment in their lives in the four weeks prior to their survey. The Aboriginal and Torres Strait Islander health performance framework (2006) found however, that when accessing health services only 16% of Aboriginal people reported being treated badly because they were indigenous. A workshop on the Social and Emotional Wellbeing of Indigenous people (2006) concedes that there was a much lower level of discrimination reported than was expected, and suggest that the current definitions of discrimination may be too narrow and exploration in this area needs to be expanded.

On a local level the Mid North Coast Aboriginal Injury Surveillance Project Report (2001) examining the interface between the Aboriginal community and emergency departments included comments from Aboriginal people such as not everybody trusts doctors at the hospital because they call the police or DOCS people just won't wait there for 3 to 6 hours so they ride it out at home until our clinic opens, sometimes for a few days normally only use A&E (Accident and Emergency Department) after hours or on weekends. There were conflicting points of view where EDIS data noted that only 15% of non-urgent presentations were required to wait for up to two hours to see the medical officer, whereas, community response indicated that in most cases they had experienced waiting times of three to six hours to see the medical officer. The report concluded that for the Aboriginal community these increased waiting times, whether perceived or real are considered to be a blatant discrimination and gate keeper mentality of health services delivery to Aboriginal people. Thomas and Anderson (2006) support this perception suggesting that many Aboriginal people believe that they might experience racist treatment or neglect in their local emergency department.

Racism, whether real or perceived, is grounded in our recent past history with Forsyth (2007) discussing the widespread use of segregation of Aboriginal people in hospitals that occurred up to the 1980s. She uncovered a practice whereby Aboriginal people were allocated to inferior wards or areas within hospitals the so called native wards. This practice of segregation was continued at Kempsey District hospital until the mid 1980s where Aboriginal women birthing in the hospital were confined to the verandah section of the maternity ward where Mum Shirl (1987) described the poor quality cold accommodation allocated to the Aboriginal women.

## Triage; part of the institutional mystique that surrounds accessing emergency departments

Triage is a dynamic process whereby patients presenting to emergency departments are prioritised according to their presenting condition in an attempt to regulate the flow of patients and identify clinical urgency. Throughout Australia and New Zealand the Australasian Triage Scale (ATS) is used to rate clinical urgency as the triage nurse asks the question “*this patient should wait for medical assessment and treatment no longer than .....*”. (Australian Council of Emergency Medicine, 2000). Because of this institutional mystique whereby patients are seen in order of priority and not arrival there can be, as Fry, Thompson et al (2002) uncovered, a lack of understanding about the triage system that leads to increased anger and frustration as it is perceived that some patients take precedence over others.

There are 5 triage categories with descriptions and benchmarks shown in the following table.

**Table 1 - The five triage categories defined by the Australasian College of Emergency Medicine used in NSW and other State Hospital Emergency Departments**

Triage Category	Description of the triage category	Target
1	Patients who need to have treatment immediately are said to have an immediately life-threatening condition. Patients in this group are critically ill and require immediate attention	100% of patients treated within 2 min
2	Patients who need treatment within 10 mins are said to have an imminently life-threatening condition. Patients in this group would probably be having something like a critical illness or very severe pain.	80% of patients treated within 10 min
3	Patients who need treatment within 30 min are said to have a potentially life threatening condition.	75% of patients treated with 30min
4	Patients who need treatment within the hour are said to have a potentially serious condition	70% of patients treated within 60mins
5	Patients who need treatment within 2 hrs are said to have a less urgent condition	70% of patients treated within 2 hours

(Table extracted from Sibbritt, Isbister, Walker, 2006).

Triage does not occur in isolation, rather in a social environment with many contextual factors influencing decisions. Anderson, Omberg et al. (2006) believe that both the personal and professional qualities of the triage nurse are the most important factors of how triage decisions are arrived at. There is a strong correlation between triage category assigned and people who did not wait, with those being triaged as category 5 (or of a lower acuity) being 11 times more likely to leave the Emergency Department prior to being seen by the medical officer (Mohsin, et al.,2007). These findings highlight the importance of accurate triaging, as waiting times are dictated to some extent by the triage category assigned.

Johnston-Leek et al. (2001), uncovered a relationship between triage category assigned and ethnic background in their Darwin (Northern Territory, Australia) study. Results indicated that there was a gross discrepancy between the admission rates per triage category of Aboriginal and non-Aboriginal people. The authors found that Aboriginal people had admission rates consistent with Australasian College of Emergency Medicine indicators of triage appropriateness; however, they identified a consistent over triaging of non- Aboriginal people suggesting the allocation of resources toward those less urgent non-Aboriginal



patients. In supporting this discrepancy Green (1998) found a higher rate of admission for Aboriginal people from lower triage categories indicating a consistent under-triaging of Aboriginal people. This finding was confirmed by Lee et al (2004) who uncovered a relatively high rate of admissions from low acuity categories for Aboriginal people supporting this phenomenon of under triaging. Whether Aboriginal people are under-triaged and required to wait longer for medical assessment, or non-Aboriginal people are over-triaged and receive medical assessment in a shorter time frame the end result is that Aboriginal people would have waited longer for treatment than non-Aboriginal people. Both Johnston-Leek et al (2001) & Green (1998) propose several explanations for this phenomena including conscious or unconscious bias, cultural differences in disease presentation, social and compliance issues, communication barriers, and the effects of drugs and alcohol.

### **Aboriginal people in emergency departments: What we already know**

In Australia, 4.3% of all patient presentations to emergency departments identify themselves as Aboriginal and/or Torres Strait Islander ( Australian Institute of Health and Welfare, 2006), with NSW Emergency Departments describing 2.8% of total presentations in 2006 as of Aboriginal origin (NSW Department of Health, 2008). It is however, well documented that incomplete recording of Aboriginal status in administrative records in NSW remains a problem, and that Aboriginal people are under-identified in emergency department data (Thomson, 2003., Australian Institute of Health and Welfare, 2006., Indigenous Australian, 2006). As previously discussed Aboriginal people in urban studies are estimated to attend emergency departments twice as often as non-aboriginal people (National Aboriginal & Torres Stait Islander Health Survey, 2005, Thomas and Anderson, 2006), and are 28-54% more likely to leave before being seen by the medical officer (Mohsin, 2002., Green, 1998., and Turner, 1995., Hall & Jelineck, 2007). Aboriginal people in the emergency department are younger with the greatest number of individuals in the 20 to 60 years age range (Lee, 2004), and are more likely to arrive by either ambulance or police escort (Mohsin, 2002). Johnston-Leek, Sprivilis et al. (2001) in a Northern Territory study reported that Aboriginal people presenting to the emergency departments were more likely to be female, have an injury, and be triaged as a category 1, 2, or 3. They found that Aboriginal people were more likely to be admitted and found no significant difference in waiting times between Aboriginal and non-Aboriginal people once triage had been assigned.

### **What do we know about people who do not wait (DNW)?**

Australian figures reveal that between 1.7% and 7.9% of all patients attending emergency departments do not wait for treatment (Brand, Kennedy et al, 2005). NSW data revealed that 5.1% of all patients attending emergency departments did not wait in the period 1st January, 2006 till the 31st December, 2006 (NSW Department of Health, 2008). A series of predominately urban studies investigating the major determinants of those people who did not wait revealed the common characteristics included an age between 15-44 years, non-English-speaking background, Aboriginal or Torres Strait Islander descent, lower socioeconomic status, and no private health insurance (Mohsin, 2005). Mohsin (2002) uncovered a did not wait rate among those people of Aboriginal or Torres Strait Islander origin at 1.31 times the rate of others. Brand, Kennedy et al (2005) confirmed that the younger male Aboriginal population dominated those patients who did not wait, and described a relationship between did not wait and patient volume in the emergency

departments. They found that periods of high patient volumes and longer waiting times for treatment resulting in increased walk outs.

Mohsin et al., (2007) in a more recent study concluded that those who did not wait were typically young children and young adults, mostly uninsured, exposed to prolong waiting times, triaged at a low acuity, and presented during the night shift. International studies confirm these predictive factors with a Canadian study by Goodacre & Webster (2005) finding that prolonged waiting time, being younger and male, low acuity rates, and time of presentation being predictors of did not wait. Rowe (2006) in a Canadian study uncovered that the most common reason for leaving the emergency department was because people were “fed up waiting”. Australian studies have confirmed this concluding that prolonged waiting times emerged as the dominant reason for those who left prior to being seen (Fry, Thompson, Chan, 2002, Brand & Kennedy, 2005). Other reasons given by patients for leaving the emergency department prior to being seen by the medical officer included resolution of the problem, too ill to stay, reassured following advice at triage, safety concerns in the waiting room, other commitments, or staff rudeness (Fry, et al, 2002).

Rates of did not wait in NSW vary significantly between emergency departments with those offering a higher referral or tertiary level of service having the highest rates, at around 6.9% and district hospitals recording the lowest rates at 2.9-3.2% of all presentations (Mohsin, 2005., Brand, Kennedy, et al, 2005). A study in Perth Western Australia reported an opposite situation whereby tertiary level hospitals had a did not wait rate of 3.5% or lower, and regional smaller hospitals had a rate of up to 6.3% (Hall & Jelinek, 2007). Mohsin (2005) believes this discrepancy may be related to the level of service provided by the emergency department, and how the characteristics of services provided impacts on people presenting for care.

### **So what about DNWs, should we care?**

Mohsin (2002) highlighted the risk of possible comprised care and the medico legal hazards for patients who left emergency departments before being seen by the medical officer. Brand, Kennedy et al, (2005) found however, that patients in this group generally have low rates of admissions on re-presentation and that serious adverse events for this group are rare. This finding is supported by Hall & Jelinek (2007) in their Perth study who found the 30 day mortality rate for those patients who did not wait to see the medical officer was significantly lower, concluding that those patients from lower acuity categories had lower mortality rates. Doherty, Hore et al (2003) found however, that 29% of patients who died following admission from emergency departments in rural NSW had been triaged as a category 4 or 5 refuting the belief that lower Australasian Triage assignment equates to less serious illness. They argue that this group although having a less time crucial presentation often encompasses a high level of complexity.

Mohsin, et al., (2007) contacted 35% of the patients who did not wait in an urban centre and found that 12.7% of those people revisited the emergency department within seven days and that 5% of those were admitted. Fry et al (2002) reported that the majority of patients who did not wait had done so safely and without experiencing any adverse outcomes. This however is contradicted in their follow up of patients which showed that 68% of did not wait patients sought alternative medical attention within 24 hours of leaving the emergency department. Brand, Kennedy et al. (2005) support this finding suggesting that approximately



half of those people who did not wait sought alternative treatment.

The Australian Council of Emergency Medicine (2001) reveals that the majority of Australasian Triage category 4 and 5 patients attend emergency departments during business hours when they contend that there is an availability of General Practitioners. Mohsin (2002) argues this point and suggests that this high level of non-urgent visits during office hours, and the early evening reflect issues related to the unavailability and difficult accessibility of primary health care during business hours. He warns that emergency departments used for non-urgent conditions become an issue in terms of the staff's ability to provide continuity of care, follow up treatment, and primary health care. Those people identified as at risk groups, including the poor, the uninsured, and those from ethnic minorities, who are more likely to visit emergency departments for non-urgent problems, and often use the service as a primary source of medical care (Mohsin, 2002).

Thomas and Anderson (2006) suggest that the difference in Aboriginal use of emergency departments is related to disease patterns, access and provision of services, and personal choice. Lee, et al (2004) in their Northern Territory study found that Aboriginal presentations to the emergency departments were higher in almost all age categories and suggested that the high utilisation of emergency department services for Aboriginal people may be related to chronic disease, infections, and co-morbidities.

These findings have a significant relevance to rural communities where access to alternative medical services is limited, especially over weekends and public holidays. General Practitioners in rural areas generally provide lower rates of bulk billing services than their urban counterparts with patients facing increased out of pocket expenses in order to access medical care (Australian Bureau of Statistics, 2005., Australian Institute of Health and Welfare, 2005). Other factors influencing access to alternative care for Aboriginal people in rural communities include availability of transport, distance, affordability, the availability of gender appropriate staff and the perception of cultural barriers (Australian Bureau of Statistics, 2005, Australian Institute of Health and Welfare, 2005). Mohsin (2005) points out that if those people who left the emergency department prior to being seen by the medical officer are unable to obtain alternative care, the health services are failing this group of patients. To date little research has been conducted on those people in rural areas who leave the emergency department prior to being seen by the medical officer, in terms of potential adverse outcomes, or safety. In reviewing current literature no studies looking specifically at Aboriginal people who did not wait, their alternative care choices, or outcomes could not be found, resulting in an extremely vulnerable group of individuals with unknown clinical outcomes in terms of morbidity or mortality.

### **Aboriginal status and discharge against medical advice: what do we already know?**

Once admitted to hospitals Aboriginal people discharge themselves from hospitals against medical advice at 19 times the rate of other Australians (Australian Health Statistic, 2006). Australian emergency department data describes the discharge against medical advice (DAMA) rate at between twice and three times that of non-Aboriginal people (Green, 1998, & Turner, 1995). Aboriginal males aged 25-44 years were most likely to discharge against medical advice at 20-30 times the rate of other Australians (Australian Health Statistics, 2005-2006). A study from the Northern Territory confirmed that Aboriginal males in the 15-44 year

*"They just don't like to wait"*

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age range were more likely to discharge against medical advice, however this occurred more commonly from paediatric, renal, obstetric, and boarder units than the emergency department (Henry, Dunbar, et, 2007). The study uncovered multiple reasons for this high rate of self discharge including personal reasons that were beyond the control of the institution, an absence of cultural security, enforcement of routines and treatment regimens that produced a culture clash, and feelings of loneliness and isolation. Franks & Beckmann (2002) uncovered that Aboriginal people in the Alice Springs hospital left prior to completion of treatment because they believed that they had been spoken to roughly by the nurse, or they did not like the way the nurse had spoken to them.

## Methods

### The Setting for this Study

Data from the NSW Department of Health (2008) shows that during the study period 1<sup>st</sup> of January, 2006 to the 31<sup>st</sup> December, 2006 a total of 1,790,538 people presented to Emergency Departments across NSW with 2.88% identifying themselves as Aboriginal or Torres Strait Islander descent. A total 5.1% of all presentations did not wait in NSW in this period. In the same period in the region serviced by the North Coast Area Health Service (NCAHS) a total of 179,817 people presented to emergency departments, of those 8,526 or 4.7% identified themselves as being of Aboriginal descent. In total 4.4% or 8,078 people did not wait in emergency departments in the NCAHS during this period.

The NCAHS covers an area from Tweed Heads in the north to Port Macquarie in the south. In the 2001 Census, local government areas serviced by the NCAHS were identified as some of the most disadvantaged in the state.

#### Map indicating location of the area serviced by the North Coast Area Health Service

NSW HEALTH | North Coast Area Health Service



### Sampling

Ethics approval for this study was given by the NCAHS Ethics committee in July 2007. All emergency departments in the NCAHS with access to the Emergency Data Information System were approached to participate in this study. Of the sites approached four hospitals Port Macquarie Base Hospital, Grafton Base Hospital, Coffs Harbour Base Hospital, and Kempsey District Hospital responded. The four hospitals that responded for ethics approval each have both differences and similarities and therefore it will be necessary to first briefly describe each site.

### ■ **Kempsey District Hospital**

Kempsey shire is part of the North Coast Area Health Service and has an estimated population of 28,160 people. Of the total population 16.8% of people identified themselves as Aboriginal (Australian Bureau of Statistics, 2001) this compares to the state average of 1.9% (NCAHS, 2006). Kempsey ranked the most disadvantaged town in the NCAHS following the 2001 census (NCAHS, 2006). On the Index of Relative Socioeconomic Disadvantage Kempsey ranked 6th in the state and had the second highest proportion of individuals for whom government cash benefits provided the predominate income (Australian Bureau of Statistics, 2001). More recently an article in the Sydney Morning Herald described Kempsey as one of the most socially disadvantaged postcodes in New South Wales (Horin, 2007).

Kempsey District Hospital has a total of 86 inpatient beds, and a level 3 emergency department service is available (NCAHS Role Delineation, 2008). During the study period a total of 16,893 people presented to the emergency department with 2,287 or 13.5% identifying as of Aboriginal descent.

### ■ **Grafton Hospital**

Grafton Hospital services a population of 29,550 people, of which 4.2% identified themselves as Aboriginal descent (Australian Bureau of Statistics, 2001). Grafton hospital has a total of 103 inpatient beds, and level 4 emergency departments it is part of the Coffs Clarence Network. The total number of presentations to the emergency department during the study period totaled 24,949 of which 1,526 or 6.1% identified themselves as Aboriginal descent.

### ■ **Port Macquarie Base Hospital**

Port Macquarie Base Hospital services a total population of 39,506 of which 2.6% of the total population identify themselves as Aboriginal status. The emergency department had a total of 25,342 presentations during the study period of which 803 or 3.1% identified themselves as being of Aboriginal descent. The hospital has 170 beds and provides a level five emergency department (NCAHS Role Delineation, 2008). Port Macquarie Base hospital is the referral hospital for both Kempsey District Hospital and Wauchope Memorial Hospital and forms part of the Hastings- Macleay Network.

### ■ **Coffs Harbour Base Hospital**

Coffs Harbour is a base hospital serving a population of 47,709 people. Of this total population 1,732 or 3.6% identify themselves as Aboriginal (Australian Bureau of Statistics, 2006). Coffs Harbour hospital has a total of 208 beds and provides a level five emergency service. During the study period a total of 32,458 people presented to the emergency department with 1,279 or 3.9% identifying themselves as of Aboriginal descent. Coffs Harbour Base hospital is the referral hospital for Grafton Base Hospital, Macksville District Hospital, Bellingen District Hospital, and Dorrigo Multi-purpose centre, and forms part of the Coffs Clarence Network.

## Analysis and Treatment of Data

EDIS was utilised to collect retrospective de-identified data on all presentations to four emergency departments in the NCAHS for a twelve month period from 1<sup>st</sup>, January, 2006 until 31<sup>st</sup> of December, 2006. Information including Aboriginal status, presenting problem, age, gender, triage category, day and time of presentation, mode of arrival, time waited to be seen by the medical officer, and discharge status, was collected.

Descriptive statistics were utilised to summarise the data looking for trends and patterns. The data from four hospitals within the NCAHS was exported from EDIS to Excel, prior to being imported to a Statistical Analytic Software (SAS) version 9 package for analysis. SAS was employed to conduct a Chi-square test to explore associations between the variables did not wait (DNW) and Aboriginal status, and discharge against medical advice (DAMA) and Aboriginal status.

Initially a total of 99,879 records were contained in the dataset when the four sites were combined. Cleaning of the data identified four errors:

1. Two records had age values of 206 (default number used by EDIS program when no date of birth is recorded)
2. four records did not have medical record numbers
3. 8460 records did not indicate time seen

It was decided to remove the offending data point 1 and 2 from the dataset, due to the small numbers and negligible effect on analysis. Point 3 was not addressed as the variable time seen was not deemed of interest to the question of did not wait and discharge against medical advice.

## Results

Due to the large amount of information being drawn from the data, presentation of results will occur in the following sequence:

- Descriptive data from the four sites will be presented including the association between the variables Aboriginal status and triage category assignment, and Aboriginal status and admission rates.
- Did not wait analysis will occur looking for an association between the variable did not wait and Aboriginal status.
- Discharge against medical advice from the emergency departments will be displayed looking for an association between the variables Aboriginal status and discharge against medical advice.

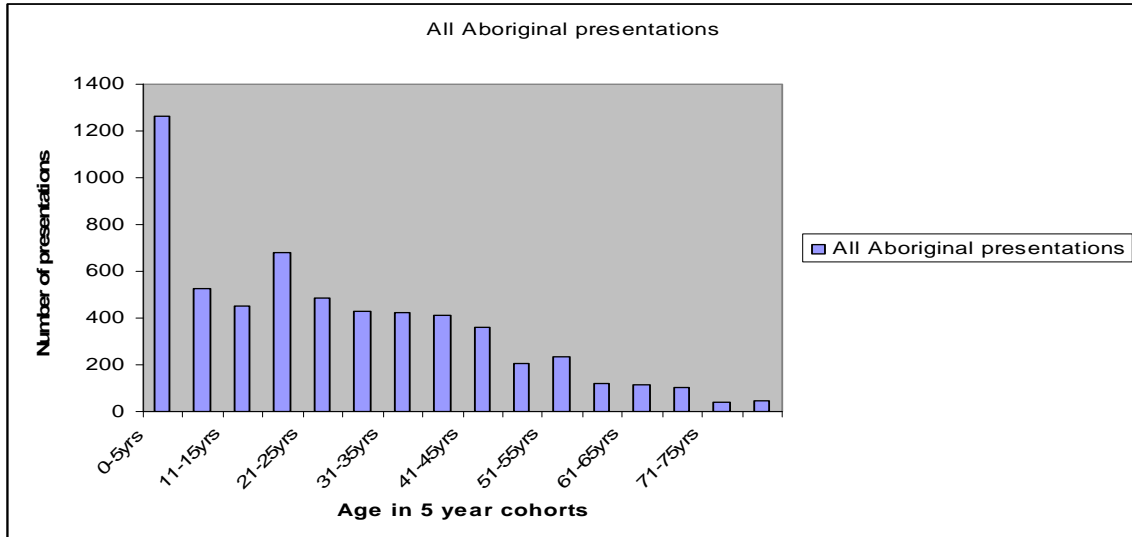
(Detailed individual site analysis is available in the Appendix Section one).

### Drawing the picture: Descriptive data

Data analysis across the four sites uncovered no difference between the percentage of Aboriginal males (51%) and Aboriginal females (48%) presenting to the emergency department. A chi-square  $X^2$  analysis of association reveals there was no evidence to support a difference in the number of Aboriginal people who arrived by ambulance when compared to non-Aboriginal people ( $X^2 = 1.74$ ,  $p$  value  $< 0.193$ ). There was no significant difference between admission rates for Aboriginal and non-Aboriginal people from the emergency departments at all four sites ( $X^2 = 1.92$ ,  $p$  value  $< 0.171$ ).

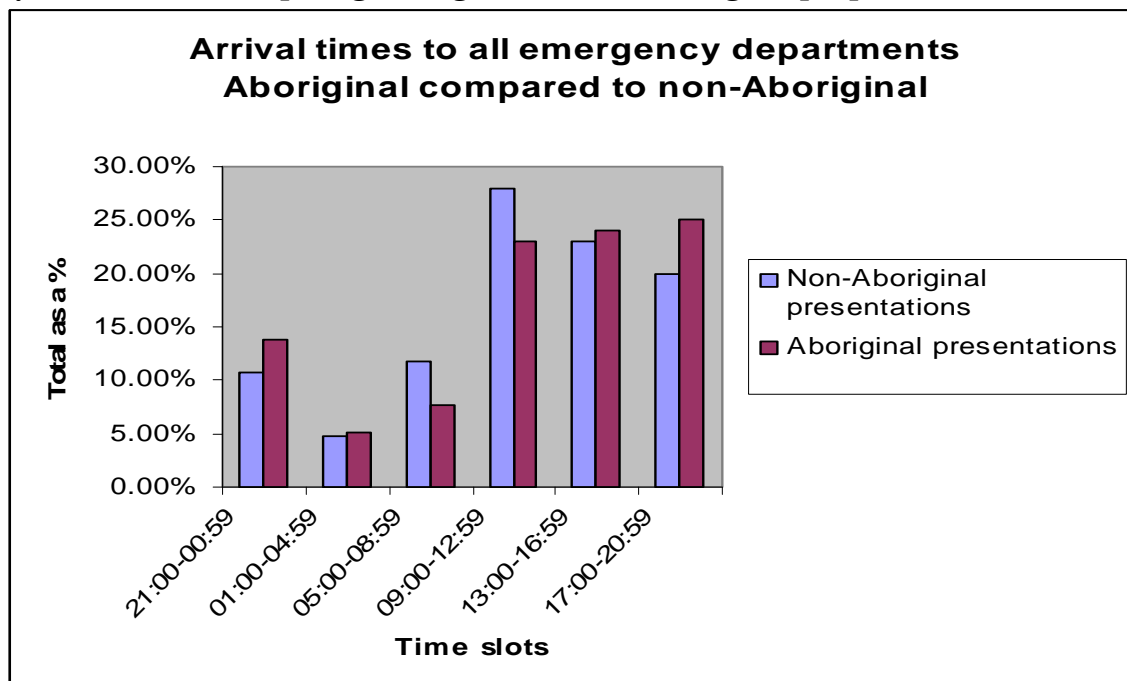
Analysis of age distribution demonstrates a younger Aboriginal population group with the majority of Aboriginal people attending the emergency department in the four hospitals in the NCAHS under the age of 45 years. Table 2 displays a break down of all presentations into 5 year cohorts, and demonstrates the younger Aboriginal population using the emergency departments in the four hospitals.

**Table 2 - All Aboriginal presentations to Port Macquarie, Kempsey, Coffs Harbour, and Grafton Hospitals in 2006 by 5 year age cohorts**



Most presentations to the emergency departments across the sites occurred during business hours with 51% of non-Aboriginal and 47% of Aboriginal presentations occurring during these times. The early evening (1700-2100hours) showed a similar peak with 20% of non-Aboriginals and 25% of Aboriginal people utilising the emergency department during these hours. Table 3 compares Aboriginal and non-Aboriginal presentations by time of presentations and demonstrates that Aboriginal are more likely to present to the emergency departments in the afternoon or early evening.

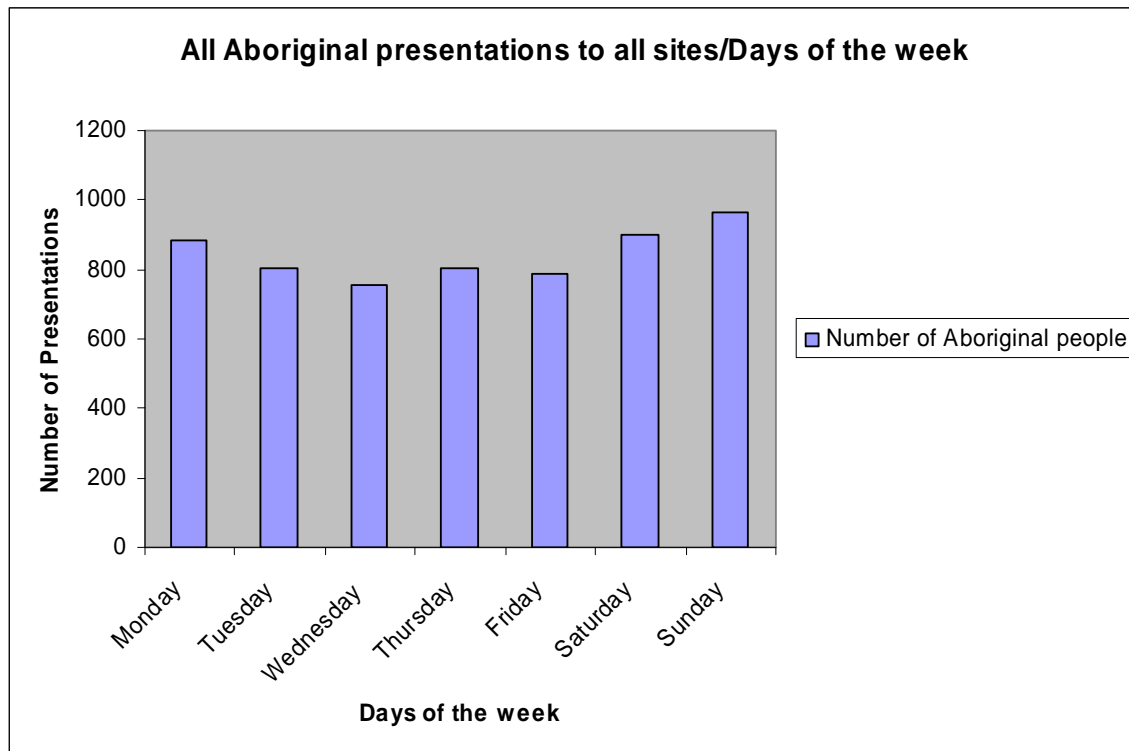
**Table 3 - All presentations to Port Macquarie, Kempsey, Coffs and Grafton Hospitals by arrival times, comparing Aboriginal and non-Aboriginal people in 2006**





The majority of presentations to emergency departments in the four sites occurred on Saturdays, Sundays, and Mondays and this trend was regardless of ethnic background. Table 4 displays all presentations to the emergency departments by day of the week demonstrating this trend.

**Table 4 - All Aboriginal presentations to emergency departments at Port Macquarie, Kempsey, Coffs Harbour, and Grafton by day of the week in 2006**



### **Triage Distribution**

Analysis of triage distribution at all four sites revealed no significant relationship between triage category assignment and Aboriginal status. Triage distribution at both Kempsey and Grafton hospitals do not follow the NSW trends with a pattern of under-triaging of all patients in category 1 and 2, and over-triaging in category 4 (Kempsey) and 5 (Grafton). This pattern is exhibited in both Aboriginal and non-Aboriginal presentations. Coffs Harbour Base and Port Macquarie Base hospital display a triage distribution most closely reflecting the state pattern with the exception being an under-triaging in the category 5 at both Base hospitals. This occurs regardless of Aboriginal status and these differences most likely relate to variations in triage practice across the sites and the acuity of patients presenting to Base hospitals. Table 5 displays the triage distribution of all presentations to emergency departments in the study and demonstrates the over-triaging in category 4 at Kempsey, and over-triaging in category 5 at Grafton.

**Table 5 - Comparison of triage distribution of all presentations to emergency departments in NSW, Port Macquarie, Kempsey, Coffs Harbour, and Grafton in 2006**

Triage category	NSW	Coffs Harbour	Port Macquarie	Grafton	Kempsey
1	0.8%	0.77%	0.5%	0.26%	0.24%
2	9.4%	8.1%	7.7%	5.6%	6.1%
3	36 %	38.0%	38.6%	32.8%	29.7%
4	40 %	43%	46.3%	37.1%	50.6%
5	12.6%	8.8%	6.6%	24.1%	13.1%

(NSW figures from Australian Hospital Statistics 2005-2006).

Analysis of triage distribution comparing admissions rates to Aboriginal status uncovered a higher admission rate for Aboriginal people in category 1. Higher admission rates are an independent indicator for the appropriateness of triage with under-triaging resulting in higher admission rates from that category. Over-triaging is indicated by lower admission rates as demonstrated in categories 4 and 5 at Coffs Harbour, Kempsey, and Grafton. This over-triaging of lower acuity presentations occurs regardless of Aboriginal status.

Table 6 examines the relationship between triage categories and admission rates at all four sites. Of note is the high percentage of Aboriginal people admitted from category 1. The relationship between triage categories and admission rates is said to be an indicator of the appropriateness of triage at a facility, however, the high number of Aboriginal people admitted may be related to co-morbidities, and other influences.

**Table 6 - Proportions of presentations in each triage category that were admitted to hospital. Aboriginal presentations to Port Macquarie, Kempsey, Coffs Harbour, and Grafton compared to all admission in NSW in the 2006**

	Triage 1	Triage 2	Triage 3	Triage 4	Triage 5
NSW All	86%	69%	47%	21%	7%
Port Macquarie Aboriginal population	100%	64%	38%	17%	6%
Coffs Harbour Aboriginal populaton	90%	70%	40%	10%	0%
Kempsey Aboriginal population	100%	67%	36%	13%	1%
Grafton Aboriginal	100%	55%	26%	8%	4%

Once triaged the data demonstrates no difference between Aboriginal and non-Aboriginal people in the times waited to be seen by the medical officer. A total of 44.1% of all non-Aboriginal people exceeded wait times compared to a total of 43.2% of Aboriginal people. Excess waiting time is calculated on the recommended times to see patients triaged in each category. Table 7 displays a breakdown of all presentations that exceeded waiting times, comparing Aboriginal people with non-Aboriginal people, and demonstrates little difference in excess wait times between the two groups.

**Table 7 - All presentations to Port Macquarie, Kempsey, Coffs Harbour, and Grafton emergency departments in 2006 by proportion of presentations that experienced excess waiting times**

<b>Waiting Time exceeded</b>	<b>Non-Aboriginal</b>	<b>% of total presentations</b>	<b>Aboriginal</b>	<b>% of total presentations</b>	<b>Total All</b>
Triage 1 - Immediately	3	0.003%	0	0%	3
Triage 2 - Over 10mins	515	0.5%	37	0.6%	552
Triage 3 - Over 30mins	13064	13.9%	863	14.6%	13927
Triage 4 - Over 60mins	23615	25.1%	1413	23.9%	25028
Triage 5 - Over 120mins	4339	4.6%	245	4.1%	4584
<b>Total</b>	<b>41536</b>	<b>44.1% of total population exceeded waiting time</b>	<b>2558</b>	<b>43.2% of total population exceeded waiting time</b>	<b>44094</b>

### Did Not Wait Analysis

The primary objective of this study was to examine if there is a significant difference in the number of Aboriginal people who did not wait to see the medical office compared to non-Aboriginal people. This has been achieved by the application of a chi-square analysis for association. To adjust for possible unaccountable (spurious) relationships, the data has been stratified using the following variables:

- Sex
- Hospital
- Age (5 year cohorts)

Combined data from the four emergency departments demonstrated very strong evidence that Aboriginal people did not wait to see the medical officer more frequently than non-Aboriginal people ( $X^2 = 64.8606$ , 1df, p value  $< 0.0001$ ). The strength of this relationship was calculated by examining the odds ratio, indicating that Aboriginal people were 1.5 times more likely than non-Aboriginal people to leave prior to being seen by the medical officer (95%CI of OR 1.3828-1.7068). There was little or no evidence to demonstrate a relationship between the number of Aboriginal males and Aboriginal females who did not wait to see the medical officer ( $X^2 = 0.18$ , p value  $< 0.671$ ).

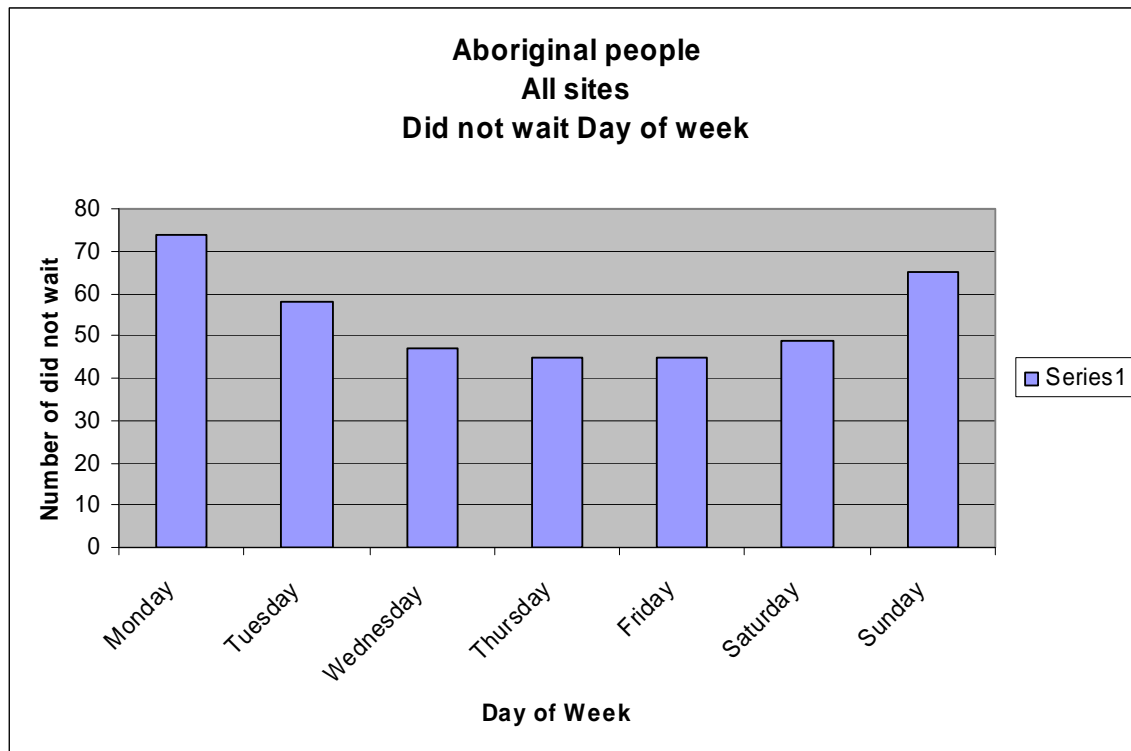
The association between arriving by ambulance and did not wait was examined using chi-square analysis. Very strong evidence was uncovered suggesting that Aboriginal people are more likely not to wait following arrival by ambulance than non-Aboriginal people ( $X^2 = 15.83$ , 1df, p value  $< 0.0001$ ). The strength of the relationship was calculated by examining the odds ratio, indicating that Aboriginal people who arrived by ambulance were 2 times more likely to do not wait when compared to non-Aboriginal people who arrived by ambulance (95% CI of OR 1.4191-2.8701).

The effect of age on did not wait was examined using chi-square analysis. Application revealed very strong evidence that those Aboriginal people aged 20-24 years were more likely to did not wait ( $X^2 = 30.3938$ , 1df, p value, 0.0001) than non-Aboriginal people. The strength of the relationship was calculated by examining the odds ratio, indicating that Aboriginal people in

this age group were 1.5 times more likely to did not wait than non-Aboriginal people (95% CI, of OR 1.3071-1.7619 ). A similar pattern was uncovered in the 35-39 age groups ( $X^2 = 37.9388$ , 1df, p value < .0001) supporting very strong evidence that Aboriginal people in this age group were 1.7 times more likely to did not wait (95% CI, of OR 1.4539-2.0739). Children in the age groups 5-9 years of age, ( $X^2 = 32.9016$ , 1df, p value < 0.0001) were 1.5 times more likely to did not wait (95% CI of OR 1.3588-1.8758), and those aged 10-14 year group were 1.4 times more likely to did not wait ( $X^2 = 17.3773$ , 1df, p value < 0.0001, 95% CI of OR 1.2248-1.7624).

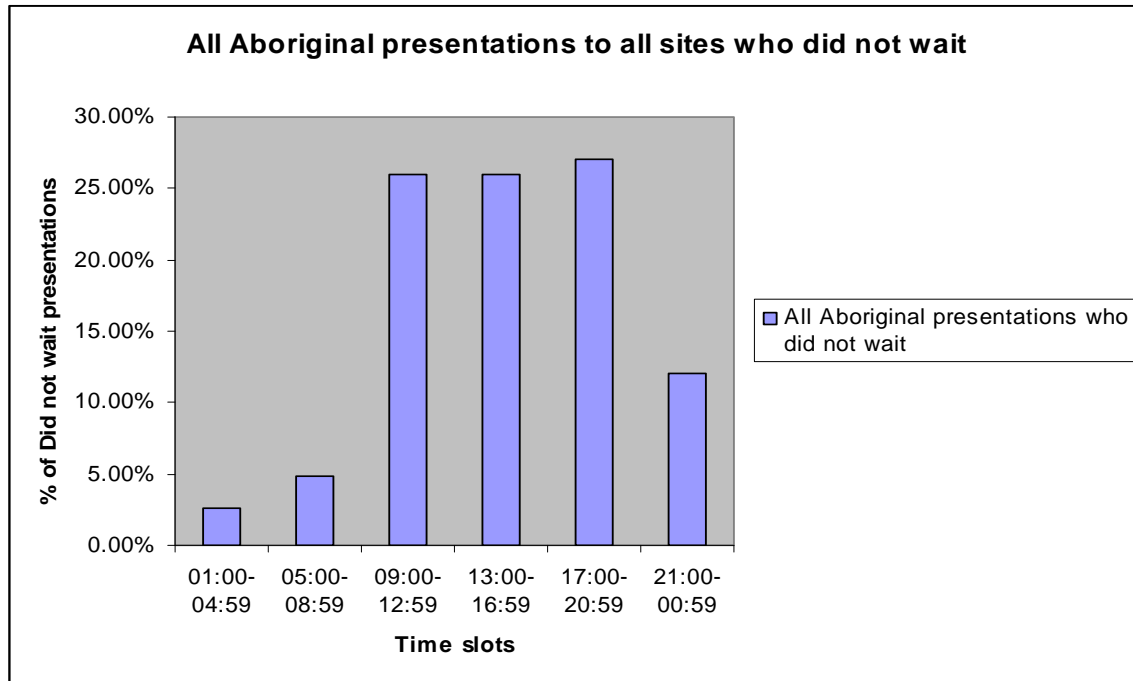
Descriptive data analysis revealed that day of the week played a role in did not wait with Aboriginal people more likely to leave on Monday, Tuesday, and Sunday; coinciding with increase patient volumes that occur on these days. Table 8 displays all Aboriginal presentations to all four sites who did not wait by days of the week, demonstrating the peaks.

**Table 8 - The proportion of Aboriginal people who did not wait at Port Macquarie, Kempsey, Coffs Harbour, and Grafton hospitals by day of week in the 2006 period.**



Data analysis revealed that the majority of Aboriginal people who did not wait in emergency departments arrived during office hours and the early evening coinciding with increase patient volumes in the emergency departments. Table 9 displays all Aboriginal presentations who did not wait in four hour time slots demonstrating the correlation to increase patient volumes on Monday, Saturday, and Sunday.

**Table 9 - All did not wait presentations from Port Macquarie, Kempsey, Coffs Harbour, and Grafton in 2006 by presentation times.**



### Discharge against Medical advice

This study revealed very strong evidence to demonstrate the association between the variables Aboriginal status and discharge against medical advice for those people presenting to Kempsey emergency department ( $X^2 = 10.056$ , 1df, p value <0.0002). The strength of the relationship was then calculated using odds ratio indicating that Aboriginal people were 2.5 times more likely to discharge against medical advice from Kempsey emergency department than non-Aboriginal people (95% CI of OR 1.4274-4.5606).

This pattern was repeated at Port Macquarie Base hospital with similar findings. A chi-square analysis of association revealed very strong evidence to support the relationship between the variable of Aboriginal status and discharge against medical advice at Port Macquarie Base hospital ( $X^2 = 12.65$ , 1df, p value <0.000376). The strength of the relationship was then calculated using odds ratio indicating that Aboriginal people were 2.4 times more likely to discharge against medical advice than non-Aboriginal people in the Port Macquarie emergency department (95% CI of OR 1.5464-4.3319).

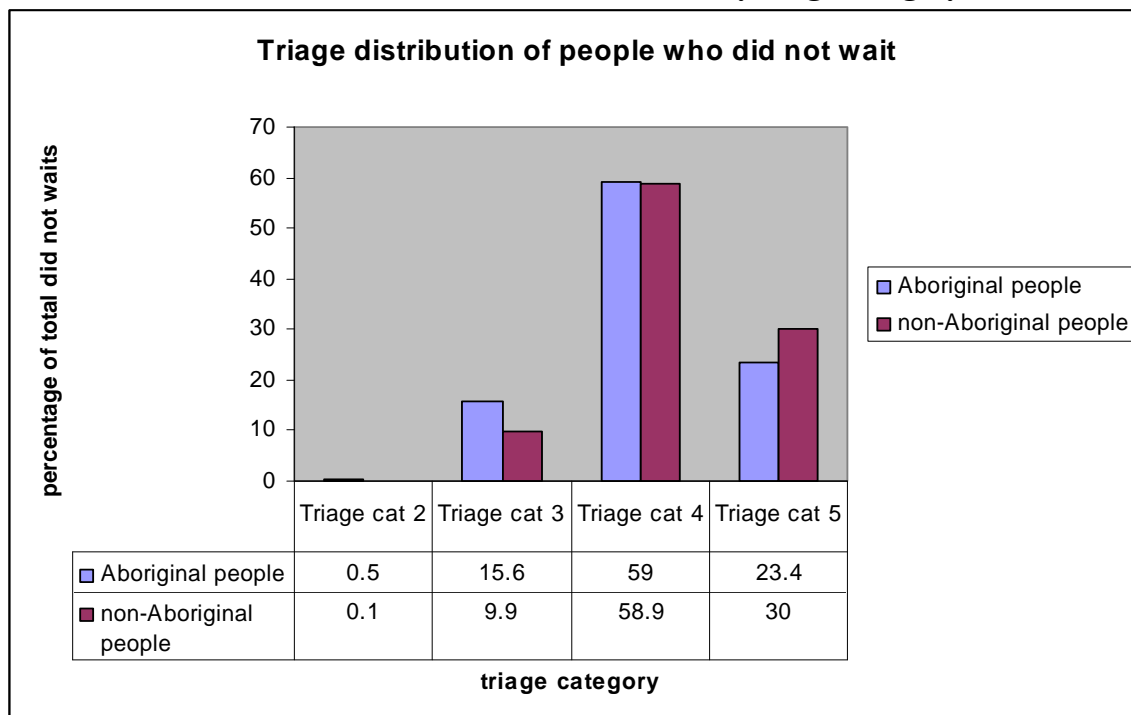
Analysis of data from Grafton hospital revealed no association between Aboriginal status and discharge against medical advice ( $X^2=3.305$ , 1df, p value <0.069). Coffs Harbour Base hospital revealed a similar pattern with little or no association found between Aboriginal status and discharge against medical advice ( $X^2 = 3.122$ , 1df, p value <0.077).

A chi-square analysis of association revealed there was no statistical difference detected between those Aboriginal and non-Aboriginal people who arrived by ambulance and then discharged against medical advice ( $X^2= 2.2$ , 1df, p value <0.09).

### The relationship between did not wait and triage categories

This study revealed that regardless of ethnic background the majority of patients who did not wait had been triaged category 4 or 5. A total of 56% of all people who did not wait had been triaged to category 4, and statistical analysis revealed a very strong association between triage category 4 and did not wait ( $X^2= 103.79$ , 1df, p value  $<0.0001$ ). The strength of the relationship was calculated using odds ratio indicating that those people triaged to category 4 were 4.8 times more likely to did not wait then those triaged to category 5 (95% CI of OR 3.5426-6.6155). This occurred regardless of ethnic background. Analysis did however, highlighted a higher did not wait rate consistent for all sites in category 3 for Aboriginal people. Table 10 displays did not wait presentations comparing Aboriginal people with non-Aboriginal people by triage category.

**Table 10 - All presentations to emergency departments at Port Macquarie, Kempsey, Coffs Harbour, and Grafton in 2006 who did not wait by triage category**



A chi-square analysis of association indicated strong evidence to support the relationship between the variable of Aboriginal people triaged to category 3 and did not wait ( $X^2= 11.26$ , 1df, p value 0.001089). The strength of the relationship was calculated by examining the odds ratio, revealing that Aboriginal people who had been triaged as a category 3 were 1.6 times more likely to leave than non-Aboriginal people (95% CI of OR 1.2397-2.2979). Of concern is the number of Aboriginal people who had been triaged as a category 3 at Port Macquarie Base hospital who did not wait. Chi-square analysis of association revealed very strong evidence of an association between the variables Aboriginal people triaged to category 3 and did not wait at Port Macquarie Base Hospital ( $X^2= 14.73$ , 1df, p value 0.000325). The strength of the relationship was then calculated using the odds ratio indicating that Aboriginal people triaged as a category 3 at Port Macquarie Base Hospital are 3.6 times more likely to did not wait when compared to non-Aboriginal people (95% CI of OR 1.8014-7.2561).



## Discussion

### What did the study reveal about those Aboriginal people who did not wait in rural emergency departments?

This study revealed that 6.6% of Aboriginal people presenting to emergency departments in the four sites did not wait compared to 4.4% of non-Aboriginals. This is consistent with other urban studies (Brand & Kennedy, 2005, Mohsin, 2005, Young, 2005, Department of Health, 2008), which revealed rates of 1.7% to 7.9%. A strong correlation between Aboriginal status and did not wait was uncovered with very strong evidence to support that Aboriginal people were 1.5 times more likely to leave prior to being seen by the medical officer. This outcome is almost uniformly observed, even after adjusting for sex, site, or age, the exception being the 40-44 year age group of Aboriginal people who displayed no significant difference when compared to non-Aboriginal people who did not wait. By stratifying the data into hospital type with Port Macquarie Base and Coffs Harbour Base hospital being the larger referral centres and Kempsey and Grafton being the smaller or District hospital the output data supports very strong evidence of the relationship between Aboriginal status and did not wait. In the Base hospitals Aboriginal people are 1.4 times more likely to leave before seeing the medical officer, and the smaller hospitals 1.8 times more likely to leave prior to being seen by the medical officer. Several explanations for these phenomena may include the increase Aboriginal population at both Grafton and Kempsey, and a trend of over-triaging in the lower acuity groups in these smaller or District hospitals. Other studies however, have uncovered a situation where-by those hospitals offering a higher referral or tertiary level of service having the highest rates of did not wait, at around 6.9% and district hospitals recording the lowest rates at 2.9-3.2% of all presentations (Brand & Kennedy, 2005, Mohsin, 2005). The results of this study more closely correlate with Western Australian data which revealed tertiary level hospitals had a did not wait rate of 3.5% or lower, and regional smaller hospitals had a rate of up to 6.3% (Hall & Jelinek, 2007).

Demographic analysis of age distribution demonstrates a younger Aboriginal population group with the majority of Aboriginal people attending the emergency departments in the NCAHS under the age of 45 years. This finding is consistent with national age distribution which describes the Aboriginal population as considerably younger than other Australians with the greatest population of Aboriginal Australians in the age groups under 20 years of age, and the lowest proportions in the age group of 40 and over (Indigenous Australians, 2006).

Most presentations to the emergency departments across the sites occurred during business hours with a total of 47% of Aboriginal presentations occurring during these times. The early evening (1700-2100hours) showed a similar peak with 25% of Aboriginal people presenting during this time. Overall there was no significant difference in the number of Aboriginal people who arrived by ambulance compared to non-Aboriginal people. Aboriginal people who did not wait were however, 1.8 times more likely to have arrived by ambulance than non-Aboriginal people who did not wait.

The effect of gender on did not wait found that female Aboriginal people were 1.6 times more likely to leave than non-Aboriginal females, and Aboriginal males 1.4 times more likely to leave than their non-Aboriginal counterparts. There was however, no significant difference between Aboriginal females and Aboriginal males who did not wait. This finding contradicts



other studies (Mohsin, 2002, Brand & Kennedy, 2005), which described Aboriginal males more likely to did not wait than Aboriginal females.

The effect of age on did not wait revealed those Aboriginal people aged 20-24 years were 1.5 times more likely to leave prior to being seen by the medical officer. A similar pattern was uncovered in the 35-39years age groups with Aboriginal people in this age group 1.7 times more likely to did not wait than non-Aboriginal people. Children in the age groups 5-9 years were 1.5 times more likely to leave, and those aged 10-14 years 1.4 times more likely to leave prior to being seen by the medical officer. These findings replicate Mohsin, et al study (2007) which concluded that typically those people who did not wait were young children and young adults.

### **Did we get triage right in the rural area?**

Analysis of triage distribution at all four sites revealed no evidence to support a relationship between triage category assignment and Aboriginal background. This finding does not support others (Lee, et al., 2004, Johnston- Leek et al., 2001) who uncovered a *gross discrepancy* between the variables of Aboriginal background and triage assignment, with Aboriginal people under-triaged, or non-Aboriginal people over-triaged.

This study does support the correlation between triage categories and did not wait finding that the majority of all patients who did not wait had been triaged in a lower acuity of category 4. Aboriginal people triaged to category 4 were 4.8 times more likely to leave prior to being seen by the medical officer than those Aboriginal people triaged to category 5. This finding contradicts other studies (Mohsin, et al. 2007) that found people triaged to category 5 were 11 times more likely to did not wait than others. As those people allocated to category 4 have been assessed by the triage nurse to have a potentially serious condition, their departure prior to being seen by the medical officer increases the risks of adverse outcomes for this group. This is a similar pattern regardless of ethnic background.

Overall 15.6% of Aboriginal people who did not wait had been triaged in a category 3. Statistical analysis revealed very strong evidence to support the relationship between the variable of Aboriginal people triaged to category 3 and did not wait. Aboriginal people who had been triaged as a category 3 were 1.6 times more likely to leave than non-Aboriginal people triaged to category 3. Of concern is the number of Aboriginal people who had been triaged as a category 3 at Port Macquarie Base hospital who did not wait. Chi-square analysis of association revealed very strong evidence to support a strong association between the variables Aboriginal people triaged to category 3 and did not wait at Port Macquarie Base Hospital. Aboriginal people triaged as a category 3 at Port Macquarie Base Hospital are 3.6 times more likely to did not wait when compared to non-Aboriginal people. Category 3 is reserved for those people who have a potentially life-threatening illness requiring treatment within 30 minutes. One explanation for this phenomenon of leaving prior to being seen by the medical officer may be a culture of triaging all children presenting to the emergency department as a category 3. Port Macquarie Base hospital offers the only paediatric service in the network servicing both Kempsey and Wauchope hospitals. Anecdotally from clinical staff working in the emergency department at Kempsey hospital, parents of Aboriginal children are reluctant to take their children to Port Macquarie due to care-givers co-commitments to other children and distance from the family network. This argument would be supported by the age

distribution of did not waits in the 5-15 year age group.

### **Discharge against medical advice what did the study uncover?**

This study found that Aboriginal people presenting to emergency departments in Port Macquarie Base hospital and Kempsey Hospital are 2.5 times more likely to discharge against medical advice than non-Aboriginal people. This is consistent with other studies (AHIW, 2006., Green, 1998., Turner, 1995) who found that discharge against medical advice rates for Aboriginal people in emergency departments were 2-3 times that of non-Aboriginal people. Findings at both Coffs Harbour and Grafton hospitals indicate no statistical difference between discharge against medical advice and Aboriginal status. This is inconsistent with data from others studies and the causes of this phenomena are unclear but further research in this area is warranted to replicate this positive outcome at other sites.

### **Strengths and Limitations of this Study**

This study presented a large sample number with at total of 99,876 presentations to the four hospitals during the study period, with 6131 of those identifying as being of Aboriginal descent. EDIS provided a reliable data collection tool with a standardised program used by all the hospitals in the study. Although the results of this study cannot be extrapolated beyond the four hospitals in this study, it does provide a rural perspective of the problem. The data collection covered a twelve month period allowing for seasonal peaks and troughs in the emergency departments. The inclusion of both Base hospital and smaller hospitals adds to the strength of the study.

This study only examined four sites within the southern end of the NCAHS and more significant results may have been obtained with inclusion of all sites. There is the continued problem of self identification of Aboriginal status which may be more prominent in hospitals with smaller Aboriginal populations.

The author acknowledges arguments related to triage distribution related to hospital size and acuity. The aim of comparing triage distribution however, was related to the variables Aboriginal status and triage category assignment. The addition of regression analysis would have added to the strength of examining relationships.

## Conclusion

The Australian Council of Emergency Medicine (2007) in its statement on the health of the Aboriginal people recognised that the improvement of Aboriginal health is among the highest health priorities in Australia and New Zealand and believes that this can be achieved by encouraging accessible, appropriate and high quality emergency medical care. Barriers to accessing emergency departments by Aboriginal people have been identified as racism, either real or perceived, poor literacy, different constructs of health and sickness, and the unavailability of culturally or gender appropriate staff. It is proposed that to achieve the NCAHS goals of creating a better experience for Aboriginal people using the health services, that the NCAHS adapts a range of options including the formation of partnerships with the local Aboriginal communities to identify barriers and improve access and cultural safety in emergency departments.

This study draws several conclusions from the data analysis and will now presents a series of recommendations that may be implemented by the NCAHS.

### ■ Conclusion one

Aboriginal people in the rural area of the NCAHS are 1.5 times more likely to leave the emergency department prior to being seen by the medical officer than non-Aboriginal people.

#### Recommendation

Based on the results of this research and the literature review it is recommended that the development and provision of culturally appropriate information be provided to Aboriginal people presenting to the emergency departments explaining the process of triage and uncovering the mystic surrounding it in an attempt to reduce feelings of racism.

Cultural safety may be improved with simple ceremonies, and local Aboriginal art in the waiting rooms of emergency departments.

Continued monitoring of the rate of did not wait and discharge against medical advice for Aboriginal people to ensure success in the outcomes of interventions.

### ■ Conclusion Two

Aboriginal people at both Port Macquarie Base hospital and Kempsey District hospitals are 2.7 times more likely to discharge from the emergency department against medical advice than non-Aboriginal people.

#### Recommendation

It is recommended that in an attempt to prevent adverse outcomes for this group the provision of culturally appropriate information regarding discharge against medical

advice acknowledging lack of alternative health options and encouraging people to return to the emergency department if concerned be provided to all Aboriginal people discharging against medical advice.

With consent of those involved notification and involvement of the Aboriginal Liaison Officer in all cases of Aboriginal people discharging against medical advice.

### ■ **Conclusion Three**

The majority of those Aboriginal people who did not wait presented during the early evening and on the weekend which in terms of access to alternative care in rural communities gives limited options.

#### **Recommendation**

Review of current allocation of resources to emergency departments, in an attempt to match the allocation of resources to periods of high patient volumes in the department.

### ■ **Conclusion Four**

Aboriginal people triaged to category 3 at Port Macquarie Base Hospital were 2.7 times more likely to did not wait than non-Aboriginal people.

#### **Recommendation**

Urgent follow up is required into the disproportionate number of Aboriginal people from category 3 at Port Macquarie Base Hospital who did not wait. Those triaged as a category 3 are assessed to have a potentially life threatening problem and must pose a significant risk of adverse outcomes if they do not wait for treatment. Further research into the reasons why this phenomenon occurs and solutions to prevent it are required.

In the interim the notification and involvement of the Aboriginal Liaison Officer at both Kempsey and Port Macquarie in all transfers of Aboriginal people to another facility may assist with the transition and provide support for personal and social issues that impact on this decision to leave.

### ■ **Conclusion Five**

To date little research has been conducted on those people in rural areas who leave the emergency department prior to being seen by the medical officer or prior to completion of treatment in terms of adverse outcomes, or safety.

#### **Recommendation**

Further research into the outcomes for this group is required to provide a rural perspective.

## ■ Conclusion Six

The high percentages of Aboriginal presentations that occur during office hours may indicate a trend to use the emergency departments as primary care centres.

### **Recommendation**

If emergency departments are to be used as a primary source of medical care this provides issues related to follow-up, and primary and preventative care models. If as others have suggested (Mohsin, 2002, Lee, et al, 2004, Johnston-Leek et al., 2001), Aboriginal people have a different way of using emergency departments that relates to chronic disease patterns, access, transport, and payment then health services need to adjust the way in which health care is delivered to this vulnerable group to improve their health outcomes. The close liaison with local Aboriginal Medical centres may provide further or more appropriate resources for primary care options for Aboriginal people.

It is acknowledge that these recommendations have been formulated prior to consultation with local Aboriginal communities and improvements in our health service can only be achieved by the formation of partnerships with the local Aboriginal communities. Currently the formation of a working party between Durri Aboriginal medical service and Kempsey emergency department is underway.

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## Appendicies

### Descriptive Data from Kempsey District Hospital

Kempsey shire is part of the North Coast Area Health Service and has an estimated population of 28,160 people. Of the total population 16.8% of people identified themselves as Aboriginal (Australian Bureau of Statistics, 2001), this compares to the state average of 1.9%. (NCAHS, 2006). Kempsey ranked the most disadvantaged town in the NCAHS following the 2001 census (NCAHS, 2006). On the Index of Relative Socioeconomic Disadvantage Kempsey ranked 6<sup>th</sup> in the state and had the second highest proportion of individuals for whom government cash benefits provided the predominate income (Australian Bureau of Statistics, 2000). More recently an article in the Sydney Morning Herald described Kempsey as one of the most socially disadvantaged postcodes in New South Wales (Horin, 2007).

Kempsey District Hospital has a total of 86 inpatient beds, and a level 3 emergency department service is available (NCAHS, 2008). During the study period a total of 16,893 people presented to the emergency department with 2,287 or 13.5% identifying as of Aboriginal descent.

Demographic analysis uncovered no difference between the number of male (51%) and female (48%) presentations, and there was no significant difference in the number of Aboriginal people (20%) and non-Aboriginal people (16%) who arrived by ambulance. Admission rates to Kempsey District hospital from the emergency department closely reflect NSW percentages. Table 1 KDH displays the % of presentations to Kempsey emergency department that were admitted compared to NSW data in the same period. Data is divided into Aboriginal and non-Aboriginal presentations. Of interest is the lower rate of admissions for Aboriginal people when compared to non-Aboriginal people.

**Table 1 KDH - Admission rates per presentation to the Kempsey Emergency Department 2006. Comparison of Aboriginal and non-Aboriginal people compared to NSW**

	All presentations NSW	Aboriginal presentations to Kempsey Hospital	Non-Aboriginal presentations to Kempsey Hospital
<b>Total of presentations admitted as %</b>	<b>30%</b>	<b>32.9%</b>	<b>35%</b>

A chi-square analysis of association reveals there was no statistical difference detected between admission rates of Aboriginal and non-Aboriginal people at Kempsey District hospital ( $X^2 = 1.13$ , p value < 0.2).

The distribution of triage categories at Kempsey hospital does not follow NSW with a pattern of under-triaging in the categories 1 and 2 and over-triaging in the 4 and 5 categories. This pattern is evident in both Aboriginal and non-Aboriginal presentations. Table 2 KDH displays the distribution of triage assignment comparing Aboriginal and non-Aboriginal presentations

to NSW data. Considering the correlation between triage category and did not wait the over-triaging to categories 4 and 5 would impact on the did not wait rate of 1.8 times more likely at the smaller hospitals.

When using admission rates per triage category as an independent indicator of the appropriateness of category this study supported a pattern of under-triaging in category 1 for Aboriginal people indicated by a high number of admissions (100%) from category 1. Non-Aboriginal people were over represented in admission rates from category 2 (75%) supporting an under-triaging of this group. Table 3 KDH displays the proportion of people from each triage category admitted from the emergency department demonstrating the over-triaging of category 4 and 5 and the under-triaging of category 1 and 2.

**Table 2 KDH - Proportion of presentations triaged to each category at Kempsey District Hospital in 2006 compared to NSW**

<b>Triage Category</b>	<b>NSW all presentations</b>	<b>Aboriginal presentations KDH</b>	<b>Non-Aboriginal presentations KDH</b>
1	0.8%	0.2%	0.24%
2	9.4%	6.2%	6.1%
3	36%	30.2%	29.7%
4	40%	51.5%	50.6%
5	12.6%	11.7%	13.1%

**Table 3 KDH - Proportion of presentations admitted from each triage category at Kempsey District Hospital Compared to NSW admission rates in 2006**

<b>Triage category</b>	<b>% Aboriginal people admitted to Kempsey hospital</b>	<b>%non-Aboriginal people admitted To Kempsey hospital</b>	<b>NSW % all presentations admitted</b>
<b>1</b>	100%	88%	86%
<b>2</b>	67%	75%	69%
<b>3</b>	36%	39%	47%
<b>4</b>	13%	14%	21%
<b>5</b>	1%	2%	7%

## Descriptive Data from Grafton Base Hospital

Grafton Hospital services a population of 29,550 people, of which 4.2% identified themselves as Aboriginal descent. Grafton hospital has a total of 103 inpatient beds, and level 4 emergency department, it is part of the Coffs Clarence Network. Grafton’s referral hospital is Coffs Harbour Base Hospital. The total number of presentations to the emergency department during the study period totaled 24,949 of which 1,526 or 6.1% identified themselves as of Aboriginal descent.

Demographic analysis uncovered no difference between the number of male (49%) and female (50%) presentations, and there was no difference detected in the mode of arrival comparing Aboriginal with non-Aboriginal people. Admission rates for Grafton hospital from the emergency department uncovered an overall lower number with 17% of Aboriginal presentations compared to 30% of all presentations to NSW emergency departments being admitted. Table 1 Grafton Hospital displays the percentage of people admitted to hospital from the emergency department at Grafton of interest is the lower number of presentations admitted.

**Table 1 Grafton Hospital - Admission rates for Aboriginal people from the emergency department compared to non-Aboriginal people at Grafton hospital in the 2006 period**

	NSW all presentations admitted from the ED	Aboriginal presentations admitted from the ED	Non-Aboriginal presentations admitted from the ED
Total admissions as a %	30%	21%	17%

One possible explanation for this variation is that Grafton being a smaller hospital may have less acuity in presentations, resulting in lower admission rates. A chi-square analysis of association reveals that there was no significant statistical difference detected between admission rates of Aboriginal and non-Aboriginal people at Grafton District Hospital ( $X^2 = 7.18, p \text{ value} < .007$ ).

The distribution of triage categories at Grafton hospital does not follow the NSW trends with a pattern of under-triaging of all patients in category 1 and 2, and 4, and over-triaging in category 5. When using admission rates per triage category as an independent indicator of the appropriateness of category selection this study supports a pattern of under-triaging in category 1 for Aboriginal people indicated by a high number of admissions (100%), and over-triaging in categories 3, 4, and 5, supported by low admission rates from these groups.

Table 2 Grafton displays the percentage of presentations allocated to each triage category at Grafton emergency department demonstrating the pattern of over and under triaging.



**Table 2 Grafton - Triage distribution rates for all presentations to Grafton Hospital in the 2006 period**

Triage	NSW	Aboriginal	Non-Aboriginal
1	0.8%	0.19%	0.27%
2	9.4%	5.6%	5.6%
3	30%	35.9%	32.6%
4	40%	34.8%	24.3%
5	12.6%	20.6%	24.3%

**Table 3 Grafton - Proportion of Presentations admitted from each Triage category at Grafton Hospital in 2006 Compared to NSW**

Triage	NSW % admitted	% admitted of Aboriginal people	% admitted of non-Aboriginal people
1	86%	100%	75%
2	69%	55%	62%
3	47%	26%	28%
4	21%	8%	8%
5	7%	4%	5%

## Descriptive Data from Port Macquarie Base Hospital

Port Macquarie Base Hospital services a total population of 39,506 of which 2.6% of the population identify themselves as being of Aboriginal descent. The emergency department had a total of 25,342 presentations during the study period of which 803 or 3.1% identified themselves as of Aboriginal descent. The hospital has 170 beds and provides a level five emergency department (NCAHS Role Delineation document 2008). Port Macquarie base hospital is the referral hospital for both Kempsey District Hospital and Wauchope Memorial Hospital and forms part of the Hastings- Macleay Network.

Demographic analysis uncovered no difference between the number of male (52%) and female (47%) presentations, and there was no significant difference when comparing percentages of Aboriginal (21%) and non-Aboriginal (25%) people who arrived via ambulance. Admission rates at Port Macquarie Base hospital closely reflect NSW percentages. Table 1 Port Macquarie displays the percentage of all presentations to Port Macquarie Base hospital that were admitted.

**Table 1 Port Macquarie - Proportion of presentations that were admitted from the emergency department to Port Macquarie Base hospital in 2006**

	NSW all presentations	Aboriginal people	Non-Aboriginal people
Admission %	30%	29%	27%

A chi-square analysis of association reveals there was no significant difference in admission rates between Aboriginal and non-Aboriginal people at Port Macquarie Base hospital ( $X^2 = 1.08$ ,  $p \text{ value} < 0.3$ ).

The distribution of triage categories at Port Macquarie Base hospital does not follow the NSW average with a pattern of under-triaging in categories 1 and 5, this pattern is regardless of ethnic background. When using admission rates per triage category as an independent indicator of the appropriateness of category selection this study identified a pattern of under-triaging in category 1 for Aboriginal people indicated by a high number of admissions (100%) from this category, and over-triaging for non-Aboriginal people in category 2 supported by a low admission rate for this group. Table 2 and Table 3 Port Macquarie display firstly the allocation of triage distribution and secondly the percentage of admission per triage category supporting this under-triaging of category 1 and 5.

**Table 2 Port Macquarie - Proportion of presentations triaged to each category at Port Macquarie Base Hospital compared to NSW in the period 2006**

Triage	NSW	Aboriginal	Non-Aboriginal
1	0.8%	0.4%	0.5%
2	9.4%	6.3%	7.7%
3	36 %	44.6	38.4%
4	40 %	42.4%	46.5%
5	12.6%	6.0%	6.6%

*"They just don't like to wait"*



**Table 3 Port Macquarie - Proportion of Presentations admitted to Port Macquarie Base Hospital from the emergency department by Triage category 2006 Compared to NSW**

<b>Triage</b>	<b>% Aboriginal admitted</b>	<b>% non-Aboriginal admitted</b>	<b>NSW % admitted</b>
1	100%	83%	86%
2	64%	55%	69%
3	38%	37%	47%
4	17%	17%	21%
5	6%	4%	7%

## Descriptive Data from Coffs Harbour Base Hospital

Coffs Harbour is a base hospital serving a population of 47,709 people. Of this total population 1,732 or 3.6% identify themselves as of Aboriginal descent. Coffs Harbour hospital has a total of 208 beds and provides a level five emergency department service. During the study period a total of 32,458 people presented to the emergency department of those 1,279 or 3.9% identified themselves as of Aboriginal descent. Coffs Harbour hospital is the referral hospital for Grafton Hospital, Macksville District Hospital, Bellingen District Hospital, and Dorrigo Multi-purpose centre.

Demographic analysis uncovered no difference between the number of male (52%) and female (47%) presentations, and there was no significant difference in the mode of arrival with 28% of Aboriginal people compared to 21% non-Aboriginal arriving by ambulance. Admission rates at Coffs Harbour Base hospital are higher for all people when compared to NSW in the same period. Table 1 Coffs Harbour displays the percentage of admissions that were admitted from the emergency department at Coffs Harbour Base hospital demonstrating a higher than state average of admissions.

**Table 1 Coffs Harbour - Proportion of presentations admitted from Coffs Harbour emergency department Aboriginal/non-Aboriginal people compared to NSW admission rates in 2006**

	NSW admission %	Aboriginal admission %	Non-Aboriginal admission %
<b>Admissions as a %</b>	30%	45%	38%

A chi-square analysis of association reveals very strong evidence to support a highly significant statistical difference between admission rates for Aboriginal people and non-Aboriginal people at Coffs Harbour Base hospital ( $X^2 = 6.86$ , 1df, p value < .0009). The strength of the relationship was calculated by examining the odds ratio, indicating that Aboriginal people were at 1.1 times more likely to be admitted to Coffs Harbour Base hospital from the emergency department than non-Aboriginals (95% CI). The higher rate of admission per presentation to the emergency department at Coffs Harbour hospital most likely reflects the acuity of patients presenting, and being transferred to the emergency department at Coffs Harbour.

Coffs Harbour Base hospital triage distribution most closely reflects NSW in categories 1, 2, and 3. There is a pattern of lower admission rates from triage categories 4 and 5 indicating over-triaged of these groups, this occurs regardless of ethnic background. Table 2 Coffs Harbour displays the percentage of presentations allocated to each triage category demonstrating an under-triaging to category 5.

**Table 2 Coffs Harbour - Proportion of Presentations triaged to each category at Coffs Harbour Base Hospital compared to NSW in 2006**

<b>Triage</b>	<b>NSW %of all presentations</b>	<b>Coffs Harbour % of all Aboriginal presentations</b>	<b>Coffs Harbour % of all Non-Aboriginal</b>
1	0.8%	0.78%	0.76%
2	9.4%	9.9%	8.06%
3	36 %	40.%	38.3%
4	40 %	43.6%	43.87%
5	12.6%	5.6%	8.9%

Table 3 Coffs Harbour displays the percentage of admissions from each triage category compared to NSW data during the same period. Under-triaging is demonstrated in category 4 and 5 by the lower admission rates from these categories.

**Table 3 Coffs Harbour - Proportion of Presentations admitted from each Triage category at Coffs Harbour Base Hospital Compared to NSW in 2006**

<b>Triage Category</b>	<b>% of Aboriginal people admitted</b>	<b>% of non-Aboriginal people admitted</b>	<b>NSW % of all presentations admitted</b>
1	90%	86%	86%
2	70%	63%	69%
3	40%	39%	47%
4	10%	10%	21%
5	0%	2%	7%

The efficiency and accuracy of individual facilities triage system can be measured and compared by examining independent indicators such as the relationship between triage category and admission rates, and patterns of triage distribution (Australian Council of Emergency Medicine, 2001). In NSW 30% of people presenting to emergency departments will be admitted (Australian Institute of Health and Welfare, 2006). The Australian Council of Emergency Medicine (2004) describes variations in the relationship between triage category and admission rates, and concedes these variations can be up to 35% between facilities.

Admission rates for all Australasian Triage Scale categories are higher in tertiary referral hospitals (Australian Council of Emergency Medicine, 2004). The relationships between triage category and admission rates for rural referral hospitals are not available. It could be argued however, that this relationship would be similar to tertiary referral hospitals due to the higher acuity of patients referred for further treatment.