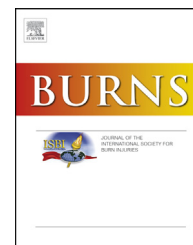


Available online at [www.sciencedirect.com](http://www.sciencedirect.com)

ScienceDirect

journal homepage: [www.elsevier.com/locate/burns](http://www.elsevier.com/locate/burns)

# Geospatial and epidemiological analysis of severe burns in New South Wales by residential postcodes



David Goltsman<sup>a,b</sup>, Zhe Li<sup>a,b</sup>, Eleanor Bruce<sup>c</sup>, Peter K.M. Maitz<sup>a,b,\*</sup>

<sup>a</sup> Burns Unit, Concord Repatriation General Hospital, Concord, NSW 2130, Australia

<sup>b</sup> Sydney Medical School, The University of Sydney, NSW 2006, Australia

<sup>c</sup> Geocoastal Research Group, School of Geosciences, Madsen Building F09, University of Sydney, NSW 2006, Australia

## ARTICLE INFO

### Article history:

Accepted 3 September 2013

### Keywords:

Burns epidemiology

Prevention

Risk analysis

## ABSTRACT

**Background:** Burns are a common trauma, affecting 1% of the Australian population annually and are associated with significant physical, psychological, social and economic burdens for victims and their families. There has been a recent paradigm shift from the treatment of burns to a more preventative approach.

**Objectives:** To examine the risk of severe burns by geographic region in New South Wales (NSW), Australia, using geospatial analytic techniques.

**Method:** Retrospective analyses were carried out to examine the 2006–2010 NSW burns data collected by the NSW Severe Burns Injury Service. Spatial analysis software was used to map the relative risk of burns by postcode areas. Spatial cluster analyses were then undertaken for the Greater Sydney Area (GSA) using Global Moran's *I* statistics and Getis-Ord analyses. High- and low-risk populations and areas were examined to ascertain differences by sociodemographic characteristics, etiology and the extent of burn.

**Results:** Scalds were the most common types of burns and men were at greater risk of burns than women. There was significant clustering of burns by postcode area, with a higher relative risk of severe burns seen in Western Sydney area and lower risk observed in Eastern and Southern Sydney. In high-risk areas burns occurred more frequently in the 13–24 months and the 20–29 years age groups, while in low-risk areas burns mostly affect the 20–29 and 30–39 years age groups. High-risk areas were characterized by socioeconomic disadvantage.

**Implications:** Mapping the risk of burns is a valuable tool for policy makers to plan and deliver targeted intervention strategies for burns prevention.

© 2013 Elsevier Ltd and ISBI. All rights reserved.

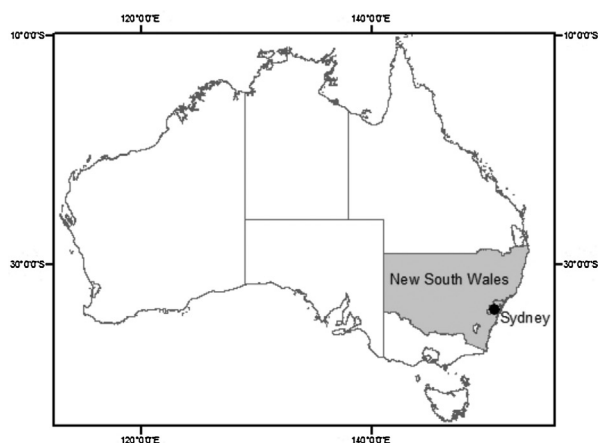
## 1. Introduction

Burns are a leading cause of un-intentional injury in low- and high-income countries [1,2], and have significant health, social and economic consequences. Patients with non-fatal burns often experience substantial physical and psychological morbidities [5]. Intensive medical and surgical intervention

is often necessitated, together with extended rehabilitation [5]. Furthermore, burns patients report high levels of psychological distress, including social anxiety, avoidance and depression [10,19].

The economic burden of burns is also significant; with hospital treatment costs estimated to be double those of patients with general medical admissions [8]. Recent studies in Australia have shown that the true cost for treatment of an

\* Corresponding author at: Burns Unit, Concord Repatriation General Hospital, NSW 2130, Australia. Tel.: +61 2 9767 7775.



1.1: Map of Australia, showing New South Wales



1.2: Map of New South Wales showing the Greater Sydney Area and the Regional Area

**Fig. 1 – Location map of New South Wales and the Greater Sydney Area.**

average adult burns patient was US\$64,157 [20]. In the USA, cost estimates of treating a patient in a specialist burns unit range from US\$3000 to US\$5000 per day [6]. In the UK, treatment of a small severe burn (2–4% of total body surface area [TBSA]) has been estimated at US\$2758 [7], and in Israel the cost of burns management averages US\$141,750 per patient [9].

Australian estimates suggest that burns affect 1% of the population per annum, with 10% of burns requiring hospital admission; 10% of these admissions are life-threatening burns [3]. Research has shown burns resulting from residential housing fires are associated with higher mortality than those from other causes. Studies from the USA report that most burns deaths occur in residential fires, particularly in housing that is crowded, occupied by low-income households, and in dwellings that house multiple families [4]. Studies in the US and internationally show that the major risk factors for burns are: age, gender, race ethnicity, education, income, access to resources, region of residence, activity undertaken when acquiring injury and comorbidity [25]. These risk factors have been shown to co-occur, resulting in additive risks of burns [26]. Obtaining an understanding into how these factors bring about increased risk, and how they may bring about additive risks, is a necessary component of devising effective and targeted burns prevention programs.

Epidemiological analyses of burns by geographical region in Australia is a powerful tool for identifying areas that can be targeted in such interventions to reduce the incidence of potentially severe burns and their associated personal, social and economic sequelae. Geographic information systems (GIS), allows maps to be generated to show individual injuries

by geographical area, permitting spatial statistics to identify their relative severities.

New South Wales (NSW) is the most populous and industrialized state in Australia [11] (see Fig. 1). Sydney is the capital of NSW, and as of June 2012 the population was estimated as 7,314,100 [27]. The majority of the population residing in NSW lives in metropolitan regions (64%) [27]. The population density in NSW is 9.1 per square kilometers and in the Metropolitan area or Greater Sydney Area the population density is 380 per square kilometer [27]. Eight local health districts provide medical care to metropolitan NSW, and seven cover rural (regional) NSW. There are three specialist burns centers in NSW located in the Concord Repatriation General Hospital (CRGH), Royal North Shore Hospital (RNSH) and the Children's Hospital at Westmead (CHW). NSW Burn patients in either metropolitan areas or in regional NSW are transferred to one of these three burns hospitals by air or land medical transport based on the severity of the burn.

The current study aims to identify the risk of severe burns by region in NSW. This study further aims to understand differences in the patterns and risk factors for burns in high- and low-risk areas. This will assist in the process of identifying regions or areas requiring targeted prevention strategies.

## 2. Method

### 2.1. Data

Data were obtained from the New South Wales Severe Burns Injury Service (NSW SBIS) for the 5-year period 2006–2010. The

Download English Version:

<https://daneshyari.com/en/article/3104493>

Download Persian Version:

<https://daneshyari.com/article/3104493>

[Daneshyari.com](https://daneshyari.com)