

# Suicide in paradise: aftermath of the Bali bombings

L. K. Suryani<sup>1</sup>, A. Page<sup>2</sup>, C. B. J. Lesmana<sup>1</sup>, M. Jennaway<sup>3</sup>, I. D. G. Basudewa<sup>4</sup> and R. Taylor<sup>3\*</sup>

<sup>1</sup> School of Medicine, Udayana University, Bali, Indonesia

<sup>2</sup> Discipline of Epidemiology and Biostatistics, School of Population Health, University of Queensland, Brisbane, Australia

<sup>3</sup> Australian Centre for International and Tropical Health, School of Population Health, University of Queensland, Brisbane, Australia

<sup>4</sup> Dr Radjiman Wediodiningrat Lawang, East Jawa, Indonesia

**Background.** The relationship between the Bali (Indonesia) bombings of October 2002 and suicide has not previously been investigated, despite anecdotal evidence of the economic and psychological consequences of these attacks.

**Method.** Suicide rates were calculated over the period 1994–2006 in three Bali regencies to determine whether suicide increased in the period following the first Bali bombings. Poisson regression and time-series models were used to assess the change in suicide rates by sex, age and area in the periods before and after October 2002.

**Results.** Suicide rates (age-adjusted) increased in males from an average of 2.84 (per 100 000) in the period pre-2002 to 8.10 in the period post-2002, and for females from 1.51 to 3.68. The greatest increases in suicide in the post-2002 period were in the age groups 20–29 and  $\geq 60$  years, for both males and females. Tourist arrivals fell significantly after the bombings, and addition of tourism to models reduced relative risk estimates of suicide, suggesting that some of the increase may be attributable to the socio-economic effects of declines in tourism.

**Conclusions.** There was an almost fourfold increase in male suicide risk and a threefold increase in female suicide risk in the period following the 2002 bombings in Bali. Trends in tourism did not account for most of the observed increases. Other factors such as indirect socio-economic effects and Balinese notions of collective guilt and anxieties relating to ritual neglect are important in understanding the rise in suicide in the post-2002 period.

Received 29 January 2008; Revised 28 April 2008; Accepted 8 May 2008; First published online 18 December 2008

**Key words:** Bali, socioeconomic factors, suicide, terrorism.

## Introduction

On 12 October 2002 members of the militant Islamic organization known as Jemaah Islamiah detonated three bombs within an hour of one another in Bali (Indonesia), killing 202 people. Of these 202 deaths, Australian citizens (88 deaths) were more than double that of any other nationality. The Balinese sustained the second greatest number of casualties (38 deaths). Anecdotal evidence suggests that communities in Bali were significantly affected by the economic and psychological consequences of the 2002 bombings. It is conceivable that these economic and psychological consequences were detrimental to the mental health of the Balinese population in the period after 2002, and that this might be an explanation of anecdotal increases in suicide and attempts reported in the province.

Previous studies have considered the effects of terrorist attacks on the World Trade Centre in New York

City on subsequent suicidal behaviour in populations (Salib, 2003; De Lange & Neeleman, 2004; Detsky *et al.* 2005); however, these studies found inconsistent associations and were not specific to the directly affected populations. By contrast, Bali is a discrete, insular Hindu population (within an overwhelmingly Muslim country) with an economy that is sustained largely through foreign tourism. The Balinese were directly affected by the October 2002 bombings, with the island being explicitly targeted due to its profound association with Western tourism. The previous three decades has seen a growing interdependence of Bali with the West, many viewing the perceived absorption of Western values into Balinese culture with alarm (Vickers, 1989; Picard, 1996). This study examines suicide rates in Bali over the period 1994–2006 to assess the effects of the 2002 bombings upon these rates and to consider socio-economic, cultural and other factors associated with this phenomenon.

## Method

### Setting

Bali is an island province of Indonesia approximately 5500 km<sup>2</sup> in size with a population of approximately

\* Address for correspondence: R. Taylor, Professor of International Health, Division of International and Indigenous Health, School of Population Health, Public Health Building, Herston Road, University of Queensland, Herston, QLD 4006, Australia.  
(Email: r.taylor@sph.uq.edu.au)

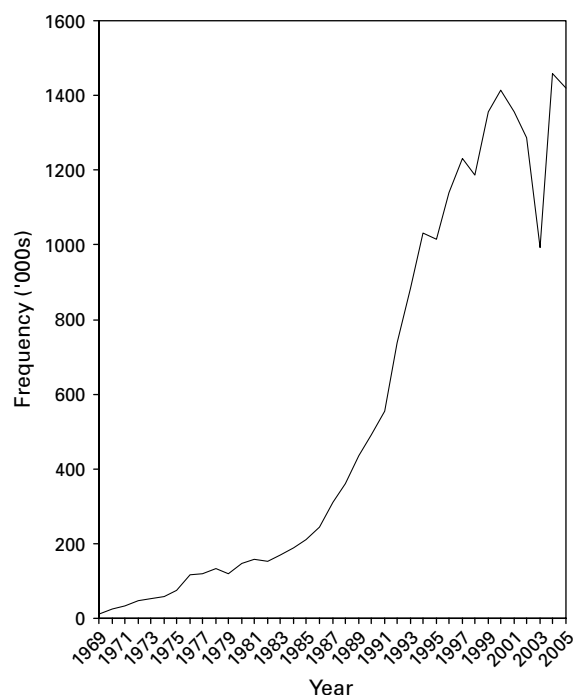


Fig. 1. Number of foreign tourist arrivals in Bali (1969–2005).

3.1 million people, comprising nine administrative regencies. Unlike the predominantly Muslim composition of the wider Indonesian population, the majority of the Balinese population are Hindu (92%), followed by Muslims (6%), with the remaining religious population being Buddhists or Christians (Badan Pusat Statistik Propinsi Bali, 2000). Bali is considered to be one of the wealthier provinces of Indonesia, predominantly due to income from foreign tourism that has developed over the previous three decades (Fig. 1). The service sector, comprising trade, hotel, restaurant and other services, and the transport and communication sector represent 55% of Bali's gross domestic product (GDP) (Statistics Indonesia, 2007a). There is also a significant agricultural sector (22% of Bali's GDP) (Statistics Indonesia, 2007b).

#### Data

Cases of suicide were enumerated through local police departments in three of the nine regencies of Bali. The enumeration of mortality data in Bali is problematic because there is no centralized vital registration system based on formal diagnosis or definition of cause of death, nor is it routinely classified according to the International Classification of Disease (ICD) codes. Deaths are reported to regency authorities by the head of the local village (*kepala desa*), and centralized at the regency (*Kabupaten*) level. The enumeration of suicide in Bali is not as problematic as for other causes of

death because all 'suspicious' deaths, including murder and suicide, are investigated and enumerated by local police departments and centralized for each regency. For this study resources and local agreements to access data could be obtained for three regencies: Buleleng (in the north), Karang Asem (in the north-east) and Tabanan (in the southwest). These three regencies represent approximately 44% of the total Balinese population. Only Buleleng contains a tourist area (that of Lovina) and none of the regencies incorporate the major tourist centres of southeast Bali (Kuta Beach, Jimbaran Bay) in which the bombings took place. Unit record data were obtained from regency police departments and aggregated by sex, age and year (1994–2006) for each area. Based on exploratory analyses of age-specific suicide rates, age groups were aggregated into the following broad age groups: 0–20, 20–29, 30–59 and  $\geq 60$  years.

Corresponding population counts by sex, age group, year and area were obtained for 1994–2006 and were based on census data (for the years 1990 and 2000) and augmented for inter-censal years using population estimates derived from representative surveys published in statistical year books for all Bali (Badan Pusat Statistik Propinsi Bali, 2000; Badan Perencanaan Pembangunan Nasional, 2005).

Data on tourist arrivals for the study period were also obtained as a key social and economic indicator (Darma Putra & Hitchcock, 2006; Dinas Pariwisata Bali, 2006), given the predominance of tourism as a source of income for Bali. Tourist numbers are collected routinely through immigration and airport arrival information. Numbers of tourists for Bali (and Indonesia as a comparison) for the period 1969–2006 were obtained and converted into a total *per capita* indicator by dividing the number of tourists by the total Balinese population.

#### Analysis

Suicide rates per 100 000 by age and sex were calculated for each year for the period 1994–2006 to examine secular trends in suicide in the period prior and subsequent to the 2002 Bali bombs. The time period selected for the analysis was based on the longest period available for which data were reliable, and to ensure a sufficient period of time to investigate secular trends in suicide (using time-series analysis) prior to the October 2002 bombings. Age-adjusted rates per 100 000 were also calculated using the direct method, using the 2000 population as the standard. It is important to note that there was a second series of bombs in October 2005. Two bombs were detonated outside two restaurants in the coastal resort of Jimbaran Bay, and a third bomb was detonated again in Kuta. This

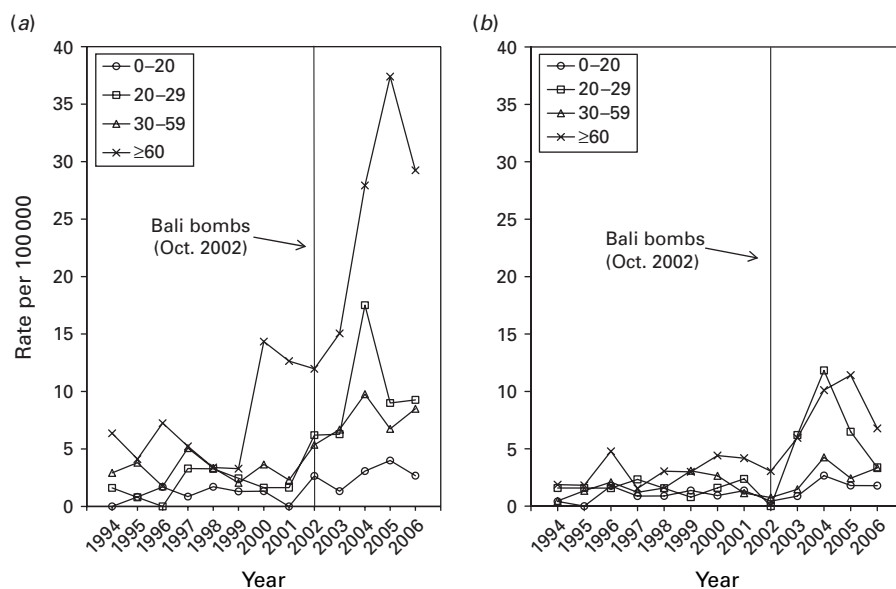


Fig. 2. Suicides per 100 000 by age and sex, 1994–2006: (a) males (b) females. Regencies included in the analysis were Buleleng, Karang Asem and Tabanan.

triplicate of bombs resulted in 23 fatalities, mostly Balinese. This second series of bombings is not considered directly in this analysis, given that the available time series of suicide data is to 2006 and thus does not provide a sufficient period of time in which to ascertain any longer-term effects on suicide rates in the study areas.

The effects of the Bali bombs were investigated in the first instance using Poisson regression models stratified by broad age group and sex to estimate the risk of suicide in the period after the first bomb (2003–2006) compared to the period prior to the first bomb (1994–2002) and to determine whether the average rate of suicide changed significantly over this period. Age-adjusted models and models adjusting for age and for tourist rates *per capita* were also conducted. The tourism rate *per capita* may be an intermediary variable between the effect of the Bali bombs and the suicide rate, and so tourism was included in models to investigate the extent to which the association between the 2002 Bali bombs and suicide is accounted for by the mediating socio-economic effects of tourism over time.

Additional analyses of the effect of the October 2002 bombs were also conducted using interrupted time-series regression analysis, with monthly suicide rates the unit of analysis. The October 2002 bombing was specified as a categorical pre-post variable (as above), variously adjusting for age, and for age and tourists *per capita*. Models adjusting for the effect of tourism relate to the period 2001–2005, which is the only period where published monthly tourist arrivals to Bali are available (Dinas Pariwisata Bali, 2006). Time

series and Poisson regression modelling was carried out in SAS version 9.1 (SAS Institute, 2003).

## Results

Male and female suicide rates increased significantly in the period after 2002. Age-adjusted suicide rates in the three regencies increased in males from an average of 2.84/100 000 in the period pre-2002 to 8.10/100 000 in the period post-2002, and for females from 1.51/100 000 to 3.68/100 000. The greatest increases in suicide in the post-2002 period were evident in the age groups 20–29 and  $\geq 60$  years, for both males and females (Fig. 2). The highest rates of suicide were in 2004 for males aged 20–29 years (17.5/100 000) and in 2005 for males aged  $\geq 60$  years (37.4/100 000), although suicide rates increased after 2002 for all ages  $> 20$  years in males and females (Fig. 2). Similar significant increases by sex and age in the post-2002 period were also evident in analyses of monthly suicide data using time-series analysis, although the average change in suicide was of a smaller magnitude than in aggregated analyses (Table 1).

The relative risk (RR) of suicide adjusted for age for males in the post-2002 period was 3.50 [95% confidence interval (CI) 2.76–4.45,  $p < 0.001$ ] compared to the pre-2002 period (RR 1.00), and for females the RR was 2.93 (95% CI 2.20–3.91,  $p < 0.001$ ) (Table 1). Adjusting for tourism rates reduced RR estimates in comparisons between pre- and post-2002 periods in both Poisson regression and time-series regression analyses; however, differences remained statistically

**Table 1.** Relative risk of suicide in three regencies of Bali in the period following the first Bali Bomb (post-2002) compared to previous periods (pre-2002), 1994–2006

Age group (years)	Suicides	Unadjusted		Adjusted for tourism	
		RR (95% CI)	<i>p</i> value	RR (95% CI)	<i>p</i> value
<b>Males</b>					
0–20	49	2.60 (1.33–5.08)	0.0050	2.40 (1.15–5.02)	0.0197
20–29	80	4.64 (2.56–8.43)	<0.0001	4.78 (2.52–9.07)	<0.0001
30–59	161	3.09 (2.17–4.40)	<0.0001	2.70 (1.84–3.96)	<0.0001
≥60	111	3.95 (2.44–6.41)	<0.0001	3.69 (2.25–6.06)	<0.0001
Total <sup>a</sup>	401	3.50 (2.76–4.45)	<0.0001	3.25 (2.52–4.19)	<0.0001
<b>Females</b>					
0–20	35	2.11 (1.09–4.06)	0.0263	2.00 (1.01–3.95)	0.0468
20–29	53	4.86 (2.64–8.97)	<0.0001	5.54 (2.93–10.49)	<0.0001
30–59	70	2.23 (1.35–3.69)	0.0018	1.90 (1.10–3.30)	0.0218
≥60	42	3.33 (1.85–6.00)	<0.0001	3.20 (1.71–5.99)	0.0003
Total <sup>a</sup>	200	2.93 (2.20–3.91)	<0.0001	2.89 (2.13–3.92)	<0.0001

RR, Relative risk; CI, confidence interval.

<sup>a</sup> Adjusted for age, and for age and tourism.

significant for males and females and across age groups (data not shown), suggesting that part of the increase in suicide post-2002 may be attributable to the socio-economic effects of declines in tourists to Bali in the period following the 2002 bombs. The greatest difference in suicide risk between the pre- and post-bomb period was evident for Buleleng Regency, followed by Karang Asem and Tabanan; however, these differences by regency were not statistically significant (data not shown).

## Discussion

This study investigated the effects of the bombings in Bali on subsequent suicide rates in three of the larger regencies of Bali by examining secular trends in suicide over the period 1994–2006 by sex and age. Suicide rates in males increased almost fourfold and in females increased threefold in the period after the first bombing in Bali (2002–2006), with greatest increases evident in young males aged 20–29 years and older males aged ≥60 years. Adjusting for tourism rates reduced RR estimates in comparisons between pre- and post-2002 periods in both Poisson regression and time-series models, suggesting that some of the differential may have been attributable to the socio-economic effects of declines in tourism to Bali. However, RRs remained statistically significant for both males and females. Other factors are important in understanding the significant increase in suicide in the post-bomb period.

There are a number of methodological factors to consider in interpreting the findings of the present

study. First, there is likely to be under-enumeration of suicide, given the lack of a formal, centralized vital registration system in Bali. However, suicide enumeration is probably substantially better than other causes of death, because local police are obligated to investigate all suspicious deaths, namely suicides and homicides, and it is likely that a near full enumeration of suicide cases is possible through these methods. It is not possible, however, to determine the extent to which suicide might be under-enumerated in the Balinese context. It is unclear how deaths reported as ‘suicide’ through the police correspond with the ICD definition. Concerning the reporting of suicide in Bali, it is also worth noting that the population is predominantly Hindu, a religion that views suicide negatively (Leenaars *et al.* 2000). There is, however, no law against suicide in Indonesia. In any case, if under-reporting is non-differential over time, this would probably have little effect on the relative differences in suicide rates in the period prior and subsequent to the Bali bombs. Given the large magnitude of the differences observed in suicide between the pre- and post-bomb periods (RRs ranged from 2.11 to 4.86), it is unlikely that enumeration bias would wholly account for these observed differences. For changes in enumeration to be the main explanation for the rise in suicide, changes in coding practices would need to coincide with October 2002, and there have been no formal changes to coding practices of which the authors are aware during this period.

Second, not all regencies of Bali were included in the present study. Adequate data could only be extracted for three out of nine regencies (Buleleng,

Karang Asem and Tabanan) for logistical reasons, and these areas (although accounting for almost half the Balinese population) may not necessarily be representative of the patterns of suicide in other areas of Bali. These areas do not include the most populated regency of Badung, comprising the capital Denpasar and the main tourist localities of Kuta, Legian, Seminyak, Sanur and Ubud. In this respect, the present study partially resembles previous studies of the (inconsistent) effects of the terrorist attacks on the World Trade Centre in 2001 on suicide and suicide attempts (Salib, 2003; De Lange & Neeleman, 2004; Detsky *et al.* 2005). A study in England and Wales found a decrease in suicide in the immediate period after September 11, 2001 (Salib, 2003), another study in Ontario (Canada) found a decrease in deliberate self-poisoning admissions to hospital in the days following September 11 (Detsky *et al.* 2005), whereas a study in The Netherlands found an increase in suicide and deliberate self-harm in the weeks following September 11 (De Lange & Neeleman, 2004). This may be because these studies were conducted in populations considerably removed from the terrorist attacks themselves (The Netherlands, the UK and Canada), and other contextual and intervening factors specific to the study context may have been more relevant in accounting for trends in suicide that coincided with the immediate period after the World Trade Centre attacks.

Although the regencies included in the present study do not correspond exactly to the areas involved in the October 2002 bombings, they are geographically proximate to the targeted areas (e.g. 1–2 hours drive away from Denpasar) and in practical terms service the tourist economies located in the areas where the bombings took place. It is likely that any effects of the bombs on suicide would be greater in these more populated tourist regions and hence the effects of the bombings on suicide would be underestimated in the areas included in the present study.

The implication of this study is that the sudden social and economic dislocation brought about by the 2002 bombings resulted in a significant increase in the incidence of suicide in Bali in the years after the bombings, from associated socio-economic effects of the decline in tourism in 2003. It is also probable that the September 11 terrorist attacks on the World Trade Centre had an indirect effect on tourism to Bali (as they had internationally) prior to October 2002. In the Australian context, campaigns to holiday domestically led to increases in domestic tourism in the post-September 11 period (Wilkinson, 2004; Athanopoulos & Hyndman, 2008). The long-term effects of the second bombings on secular suicide trends in Bali are not clear, given that the present study is based on

data up to 2006 (that is only one year past the 2005 bombings).

Just as the Western sociological literature has demonstrated that indicators of social integration and connectedness, such as socio-economic equality, urbanization and religiosity, are associated with lower suicide rates (Stack, 2000*a,b*), social dislocation brought about by social and economic upheaval can also result in higher suicide rates and marked temporal increases in suicide (Pridemore & Spivak, 2003). This effect of social dislocation and suicide is also consistent with previous studies of the effects of population-level 'disasters' (and associated social upheaval) such as earthquakes and hurricanes (Yang *et al.* 2005; Kessler *et al.* 2006), although decreases in suicide have also been found subsequent to natural disasters (Shioiri *et al.* 1999) and also for war (Stack, 2000*b*). Collective responses to such events are likely to be context specific, and natural disasters and war differ in their origin, if not their effects, from terrorist bombings for which the explicit rationale is to instil fear in populations and disrupt factors associated with social cohesion.

In the context of Bali there are additional psychological, cultural and spiritual factors that are of importance (Suryani & Jensen, 1993). The centrality of Hinduism in Balinese culture and the belief that social and personal misfortune is a consequence of ritual neglect (Hooykaas, 1974) are important dimensions in understanding the findings of the present study. Such neglect can include a failure to observe appropriate rituals or to carry out proper practices in accordance with the imputed wishes of a panoply of spiritual forces, including ancestors, demons and deities (Hooykaas, 1974). Widespread calamities and their social and health consequences have historically been interpreted in Bali as signalling a collective failure in this regard (Stuart-Fox, 1979; Lovric, 1987). It is likely that both the 2002 and 2005 bombings have likewise been interpreted as both a collective and an individual failure on the part of Balinese people to conduct themselves in accordance with the wishes of these unseen forces that govern the natural and cosmic universe (*buana agung*) (Muninjaya, 1982). In such circumstances, communal guilt may become manifest in unusual and distressing ways, compounding existing distress associated with material and economic factors and other more proximate antecedents associated with suicide (such as hopelessness, psychological distress and mental disorder).

Of particular note is that the largest increase in suicide occurred in those aged 20–29 years, particularly males. This age group is perhaps most vulnerable in the context of rapid social change and associated economic effects on, for example, employment.



Previous studies of suicide in Western developed contexts have shown that socio-economic deprivation (Taylor *et al.* 2005; Page *et al.* 2006; Rehkopf & Buka, 2006), especially changes in employment status (Morrell *et al.* 1999; Platt & Hawton, 2000), can be associated with increased suicide in younger age groups. This may be applicable to the Balinese context, where most sectors are directly or indirectly affected by foreign income and tourism. Unemployment in Bali increased in the period after 2002, from approximately 2.8% in 2000–2002 to 6.0% in 2003, and then declined to approximately 4.6% in 2004–2005 (Statistics Indonesia, 2007b).

A large increase in suicide in the post-bomb period was also evident in those aged  $\geq 60$  years, which followed upon an already increasing trend in males in this age group. The increase in the period from 1997 to 2002 coincides with the Asian economic crisis of 1997, the fall of the Soeharto regime, and the consequent economic dislocation experienced across the Indonesian archipelago. The socio-economic and cultural dimensions noted above for the younger age groups are also likely to be relevant in interpreting the increase in the  $\geq 60$  years age group. For the younger age group, there are the direct material effects on socio-economic circumstances, in terms of employment and income, but for the older age group these socio-economic effects are more likely to be indirect. This age group is likely to be dependent on extended family in younger age groups, and increased suicide in older age groups may reflect increased social and economic strain on family and social networks.

It is conceivable that delayed economic effects of the Asian economic crisis led to rises in unemployment that subsequently resulted in the increases in suicide that coincided with the post-2002 period. To sustain this interpretation of the findings, the strong contemporaneous association between the October 2002 bombs would need to be ignored, as well as the lack of any change in the suicide rate (with the exception of  $\geq 60$ -year-old males) occurring in the 1997–1999 period, the peak of the crisis (Weisbrot, 2007). This is not consistent with the contemporaneous rises in suicide in all age groups most affected by the economic crisis for countries where data are available (Japan, Republic of Korea), which occurred during 1997–1999 (Australian Institute for Suicide Research and Prevention, 2003). Unemployment may be a key factor associated with the increase in suicide in Bali in the post-bomb period; however, it is logically unsustainable to suggest that the bombings were an intermediary between unemployment and suicide, rather it is more likely that patterns of unemployment were affected by the social and economic effects of the October 2002 bombs.

## Conclusions

This study found that suicide in Bali increased almost fourfold in males and threefold in females in the period after the 2002 bombings, with the largest effects evident in the young adult age group (20–29 years) and the elderly ( $\geq 60$  years). Trends in tourism partially accounted for observed differences in the period pre- and post-bombs. Other factors such as indirect socio-economic effects and the centrality of Hinduism in Balinese culture, especially notions of collective guilt and anxieties relating to the neglect of ritual, are important in understanding the sharp rise in suicide in the post-2002 period. Although the suicide rate in Bali is fairly low compared with developed countries, such as Australia (Morrell *et al.* 2007), the sharp rise occurring contemporaneously with a catastrophic event that explicitly aimed to cause social and economic dislocation demonstrates the importance of contextual factors in understanding the aetiology of suicide, and also the need for local Balinese authorities to address the ongoing social, economic and psychological adjustment in post-bomb Bali.

## Declaration of Interest

None

## References

- Athanasopoulos GA, Hyndman RJ (2008). Modelling and forecasting Australian domestic tourism. *Tourism Management* **29**, 19–31.
- Australian Institute for Suicide Research and Prevention (2003). *International Suicide Rates: Recent Trends and Implications for Australia*. Australian Government Department of Health and Ageing: Canberra.
- Badan Perencanaan Pembangunan Nasional (2005). *Indonesia Population Projection, 2000–2025*. Badan Pusat Statistik and United National Population Fund: Jakarta.
- Badan Pusat Statistik Propinsi Bali (2000). *Bali Dalam Angka (Bali in Figures), 1994–2000*. Badan Pusat Statistik Propinsi Bali: Denpasar.
- Darma Putra IN, Hitchcock M (2006). The Bali bombs and the tourism development cycle. *Progress in Development Studies* **6**, 1–10.
- De Lange AW, Neeleman J (2004). The effect of the September 11 terrorist attacks on suicide and deliberate self-harm: a time trend study. *Suicide and Life-Threatening Behavior* **34**, 439–447.
- Detsky ME, Sivilotti MLA, Kopp A, Austin PC, Juurlink DN (2005). Deliberate self-poisoning in Ontario following the terrorist attacks of September 11, 2001. *Journal of the American Medical Association* **294**, 1900–1901.
- Dinas Pariwisata Bali (2006). *Bali Tourism Statistics 2005*. Dinas Pariwisata Bali: Denpasar.
- Hooykaas C (1974). *Cosmogony and Creation in Balinese Tradition*. Nijhoff: The Hague.

- Kessler RC, Galea S, Jones RT, Parker HA, on behalf of the Hurricane Katrina Community Advisory Group (2006). Mental illness and suicidality after Hurricane Katrina. *Bulletin of the World Health Organization* **84**, 930–939.
- Leenaars A, Cantor CH, Connolly J, EchoHawk M, Gailliene D, Zhao XH, Kokorina N, Lopatin A, Lester D, Rodriguez M, Schlebusch L, Takahashi Y, Vijayakumar L (2000). Ethical and legal issues. In *The International Handbook of Suicide and Attempted Suicide* (ed. K. Hawton and K. van Heeringen), pp. 421–435. John Wiley & Sons, Ltd: Chichester.
- Lovric B (1987). Bali: myth, magic and morbidity. In *Death and Disease in Southeast Asia: Explorations in Social, Medical and Demographic History* (ed. N. Owen), pp. 117–141. Oxford University Press: Singapore.
- Morrell S, Page AN, Taylor RJ (2007). The decline in Australian young male suicide. *Social Science and Medicine* **64**, 747–754.
- Morrell S, Taylor R, Quine S, Kerr C, Western J (1999). A case-control study of employment status and mortality in a cohort of Australian youth. *Social Science and Medicine* **49**, 383–392.
- Muninjaya AAG (1982). Balinese traditional healers in a changing world. In *Indonesian Medical Traditions* (ed. D. Mitchell), pp. 35–41. Centre for Southeast Asian Studies, Monash University: Monash.
- Page A, Morrell S, Taylor R, Carter G, Dudley M (2006). Divergent trends in suicide by socio-economic status in Australia. *Social Psychiatry and Psychiatric Epidemiology* **41**, 911–917.
- Picard M (1996). *Cultural Tourism and Touristic Culture*. Archipelago Press: Singapore.
- Platt S, Hawton K (2000). Suicidal behaviour and the labour market. In *The International Handbook of Suicide and Attempted Suicide* (ed. K. Hawton and K. van Heeringen), pp. 309–384. John Wiley & Sons Ltd: Chichester.
- Pridemore WA, Spivak AL (2003). Patterns of suicide mortality in Russia. *Suicide and Life-Threatening Behavior* **33**, 132–150.
- Rehkopf DH, Buka SL (2006). The association between suicide and the socio-economic characteristics of geographical areas: a systematic review. *Psychological Medicine* **36**, 145–157.
- Salib E (2003). Effect of 11 September 2001 on suicide and homicide in England and Wales. *British Journal of Psychiatry* **183**, 207–212.
- SAS Institute (2003). *SAS Statistical Software Version 9.1*. SAS Institute Inc.: Cary, NC.
- Shioiri T, Nishimura A, Nushida H, Tatsuno Y, Tang SW (1999). The Kobe earthquake and reduced suicide rate in Japanese males. *Archives of General Psychiatry* **56**, 282–283.
- Stack S (2000a). Suicide: a 15-year review of the sociological literature. Part I: Cultural and economic factors. *Suicide and Life-Threatening Behavior* **30**, 145–162.
- Stack S (2000b). Suicide: a 15-year review of the sociological literature. Part II: Modernization and social integration perspectives. *Suicide and Life-Threatening Behavior* **30**, 163–176.
- Statistics Indonesia (2007a). *Statistics of Bali Province: Regional Income*. Statistics Indonesia, Jakarta (<http://bali.bps.go.id/2006/regincome/diskon.htm>). Accessed 25 September 2007.
- Statistics Indonesia (2007b). *Statistics of Bali Province: Unemployment Rate*. Statistics Indonesia, Jakarta (<http://bali.bps.go.id/2006/employment/unemployment.htm>). Accessed 25 September 2007.
- Stuart-Fox D (1979). *Eka Dasa Rudra: 100-Year Ceremony at Pura Besakih*. Panitia Karya Agung Eka Dasa Rudra: Denpasar.
- Suryani LK, Jensen GD (1993). *Trance and Possession in Bali: A Window on Western Multiple Personality, Possession Disorder, and Suicide*. Oxford University Press: New York.
- Taylor R, Page A, Morrell S, Harrison J, Carter G (2005). Mental health and socio-economic variations in Australian suicide. *Social Science and Medicine* **61**, 1551–1559.
- Vickers A (1989). *Bali: A Paradise Created*. Periplus: Berkeley.
- Weisbrot M (2007). Ten years after: the lasting impact of the Asian financial crisis. In *Ten Years After: Revisiting the Asian Financial Crisis* (ed. B. Muchhala), pp. 105–118. Woodrow Wilson International Center for Scholars: Washington, DC.
- Wilkinson J (2004). *Tourism in NSW: After September 11*. Briefing Paper No. 6/04, New South Wales Parliamentary Library, Sydney.
- Yang CH, Xirasagar S, Chung HC, Huang YT, Lin HC (2005). Suicide trends following the Taiwan earthquake of 1999: empirical evidence and policy implications. *Acta Psychiatrica Scandinavica* **112**, 442–448.