Fire Research Report

Where in New Zealand have fatal domestic fires occurred? Descriptive analysis of data 1986 - 1998

University of Otago

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This report to the New Zealand Fire Service Commission shows the geographic distribution of fatal structural fire incidents in New Zealand from July 1996 to June 1998, at census meshblock and territorial authority level.

Those territorial authorities with high fatal fire incident rates are also those with high rates of poverty, poor housing, undereducated populations and sole parenting. This descriptive analysis suggests that in the wider analytical study it may be useful to include specific factors which may indicate fire risk. Analytical epidemiology may help to quantify the relative importance of the different risk and protective factors associated with fatal fire incidents in the domestic location.

Fatal fire incidents do not occur randomly but occur more frequently, per 100,000 private dwellings, in certain geographical areas. Further analysis of geographical data is likely to be of benefit in identifying vulnerable communities, and in identifying the factors associated with fatal fire incidents in different communities.

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Introduction

This report to the New Zealand Fire Service Commission shows the geographic distribution of fatal structural fire incidents in New Zealand from July 1996 to June 1998, at census meshblock and territorial authority level.

This report is part two of two research reports commissioned by the New Zealand Fire Service through the contestable research fund.

Part one describes the relationship between socioeconomic deprivation and risk of death in domestic fire events.

Project objective

To describe the geographical patterns of fatal domestic fire incidents in New Zealand.

Methods

Data

New Zealand fire mortality data were obtained from the New Zealand Fire Service Fire Information Recording System (FIRS) for the period July 1988 to June1998. A subset of these data has previously been matched with New Zealand Health Information Service data and found to be per cent complete (personal communication Angela Pidd NZHIS September 1999).

Private dwelling data were obtained from Statistics New Zealand. This figure excludes hotels, motels and other non-private dwellings.

Inclusion and exclusion factors

All incidents occurring in residential structures, in mobile property being used as a structure (caravans) and in mobile structures on residential property were included in the study. The latter included parked vehicles within domestic properties.
Intentional injury incidents were excluded from the study.

Geocoding

Incidents were geocoded to census meshblock level and mapped onto a standard New Zealand coastline map. Rates in each territorial authority were calculated using the total private dwelling count in the 1991 census (mid-point of the time period). This use of a mid-point denominator figure may have underestimated rates in the earlier part of the time period, and overestimated rates in the latter part. However it is adequate to provide an overview of geographical patterns.

Results

Location of fatal fire incidents in New Zealand 1986-1998

Fatal fire incidents tend to follow population trends. As shown in Figure 1 the majority of incidents occurred close to the main centres. These data will be incorporated into the analysis of surveillance data to identify factors associated with rural fatal fire incidents compared with incidents in urban localities.

Rates of fatal fire incidents in territorial local authorities

Rates of fatal incidents were highest in provincial local authorities. Figure 2 shows the rate of fatal incidents in each territorial authority. Range breaks were determined according to an algorithm such that the difference between data values and the average of the data values is minimised on a per range basis. The number of local authorities in each range is shown in Table 1.

Table 1. Number of local authorities in each range of rates as shown in Figure 2.

Range	Number of Local Authorities
31-82	7
15-31	15
9-15	10
3-9	15
0-3	26

Characteristics of the local authorities with the highest annualised rates of fire related mortality are listed in Table 2. Those territorial authorities with high fatal fire incident rates are also those with high rates of poverty, poor housing, undereducated populations and sole parenting. This descriptive analysis suggests that in the wider analytical study it may be useful to include specific factors which may indicate fire risk. Analytical epidemiology may help to quantify the relative importance of the different risk and protective factors associated with fatal fire incidents in the domestic location.

Conclusion

Fatal fire incidents do not occur randomly but occur more frequently, per 100,000 private dwellings, in certain geographical areas. Further analysis of geographical data is likely to be of benefit in identifying vulnerable communities, and in identifying the factors associated with fatal fire incidents in different communities.

Table 2. Annualised fatal injury rate in domestic fire incidents July 1996 to June 1998 by Territorial Authority. Data sources NZ Fire Service, Statistics New Zealand.

Territorial authority	Annualised fatal incident rate per 100,000 private dwellings	Percentage of dwellings owned by occupier	Percentage of the population who are current smokers	Percentage of people who have no academic qualifications	Percentage of households with at least one sole parent family
Kawerau District	6.86	47	47	49	29
Grey District	3.29	38	38	44	17
Taupo District	3.07	35	35	39	19
Ruapehu District	3.03	28	28	43	20
Waimate District	2.85	36	36	45	11
Otorohanga District	2.76	33	33	45	14
Papakura District	2.61	41	41	40	22
Hurunui District	2.29	35	35	37	9
South Waikato District	2.01	39	39	46	21
Waitaki District	1.97	36	36	44	11
Central Hawke's Bay District	1.83	36	36	42	16
Dunedin City	1.74	38	38	30	16
Manawatu District	1.71	42	42	40	15
Gisborne District	1.64	32	32	42	24
Whakatane District	1.50	35	35	42	21
Wanganui District	1.49	35	35	42	22

Central Otago District	1.45	34	34	38	10
Rangitikei District	1.43	34	34	42	16