



Disaster and economic resilience in small regional communities: the case of Toodyay

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We explore the effects of a small bushfire on the income trajectory of employed residents of Toodyay, a regional town in Western Australia. Our study reveals how detailed profiling, using public data, can overcome statistical limitations in disaster risk reduction exercises and better direct post-recovery interventions to minimise disruptions to important income streams in small regional towns.

THE TOODYAY FIRES

Toodyay is a small regional town in Western Australia. The 2009 fires burnt around 2,900 hectares (2%) of the Shire's total area, destroyed 38 houses, damaged over 170 properties, with total damage costs estimated at \$100 million.

METHODOLOGY

Using a difference-in-differences model and ABS Census Longitudinal dataset (2006, 2011), the research investigates the income effects of the 2009 Toodyay bushfire on the income trajectory of employed residents at an SA2 level. While our model usually disaggregates sectoral and demographic effects, Toodyay's small population constrained the sample size, making it difficult to achieve statistical power and limiting what we could report on for ABS confidentiality reasons.

RESULTS

Overall, the Toodyay fires did not have a significant effect on the income trajectory of employed residents of the town. While we can't report point estimates (large standard errors), their signs inform us of the likely heterogeneous impacts on demographic groups had the sample size been larger. Young people (< 25 years), females, low-income individuals, and those with lower education levels (high school only) are relatively more disadvantaged than others within their demographic groupings.

EXPLAINING THE RESULTS

Apart from the issue of small sample size, our demographic profiling reveals other factors influencing the resilience of the overall Toodyay workforce to disruptions to their income:

- **Degree of economic exposure:** With a significant number of non-employing local businesses, employed residents mostly work outside Toodyay. This fact, and the historical shift away from disaster-sensitive industries naturally limits the fire's effect on the overall income trajectory.
- **Speed of recovery activities:** Compared to bushfires with significant effects (e.g. VIC Black Saturday bushfires), the Toodyay fire was relatively small and quickly contained (14 hours), with 29% of public assistance distributed within first three months. Employed residents' continued access to neighbouring areas they are economically dependent on is likely to have significantly contributed to reducing or eliminating any persistent income losses they could have experienced.
- **Known vulnerabilities:** the disadvantaged groups coincide with those identified in the literature as being more vulnerable to natural disasters. The heterogeneity in the fire's effects also mirrors observed effects in other case studies (VIC Black Saturday Bushfires 2009 and QLD Floods 2010-11).

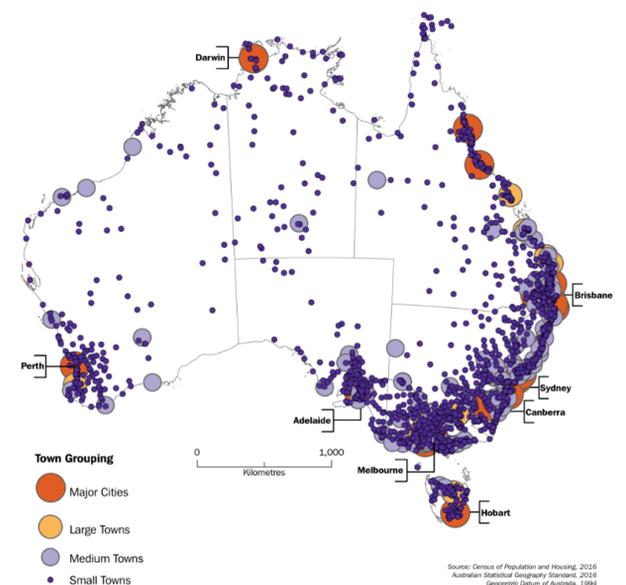


Figure 1: Australian towns, by population size groupings 2016^a

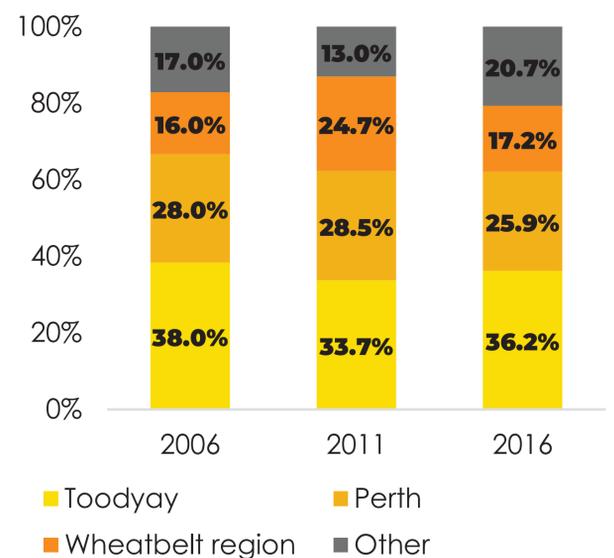


Figure 2: Toodyay residents place of work^b

^a ABS 2018, Small Towns, Reflecting Australia - Stories from the Census, 2016. CAT 2071.0 ^b ABS Census Tablebuilder