

Black Saturday bushfires: counting the cost

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When bushfires ripped through the heart of Victoria on a scorching Saturday a decade ago, the impact was likened to 1500 Hiroshima-style bombs exploding across the state.

In one of the world's worst bushfire events ever recorded, the Black Saturday bushfires claimed 173 lives, burnt 450,000 hectares of land, and destroyed 2000 homes and 1500 buildings. While the initial and obvious cost of the devastation was estimated, the more hidden and enduring economic loss is still being counted.

Ten years on, what economic legacy did Black Saturday leave the individuals and communities in its wake and how can this knowledge better protect us in the future?

Intangible costs

Calculating the full cost of a disaster such as the Black Saturday bushfires is a complex task that depends on a chain of influences such as geography, population and economic sectors.

While it's relatively straightforward to add up the tangible costs, estimating the long-term economic impact of a disaster on people's lives, health and wellbeing, business loss or disruption and clean-up, recovery and assistance activities is far more challenging.

As researchers within the Deakin Business School's Department of Economics and Centre of Energy, the Environment and Natural Disasters, we are working with the Bushfire and Natural Hazards Cooperative Research Centre looking at the income effects of the Black Saturday bushfires on the people who lived in the disaster-hit areas.

Income is a key indicator of economic resilience because the ability to bounce back to pre-disaster income levels shows an aspect of the individual's resilience to disasters.

Because disasters affect individuals differently, we delve beyond average income losses in the disaster-hit areas to examine different demographic groups such as gender, age, low income, middle income, high income individuals, homeowner status and how individuals in each sector were affected.

Until now, there has been a research gap in understanding the effects across different employment sectors. By examining the income changes in 19 sectors

we've been able to see how, over time, this calamitous event has rippled through communities and the broader economy.

Findings like this help policy makers better assess the levels of resilience and design effective plans for post-disaster interventions and assistance.

Methodology

Research commenced by computing the disaster severity of 12 non-contiguous bushfire hotspots of varying sizes within the state of Victoria. These 12 hotspots cover 37 Statistical Area-2s (SA2), which are medium-sized general-purpose areas that represent a community that interacts together socially and economically, roughly corresponding to postcodes. We found that the percentage of burnt areas in a given SA2 ranged between 0.1 and 72.2 per cent. These differences in the share of burnt areas provided useful information to see how incomes change across different levels of disaster severity.

Key data (income, residential SA2 and other economic, demographic and sectoral indicators) were gathered from the Australian Census Longitudinal Data of 2006 and 2011 of the Australian Bureau of Statistics. This meant we were able to track individuals and see how their situations had changed before and after the 2009 Black Saturday event.

We based this on a difference-in-differences approach that compared the incomes of individuals living in disaster hit areas before and after the catastrophe with those of individuals who live in the comparable neighbouring areas with no bushfire exposure.

Results

Not surprisingly, the results showed that the Black Saturday bushfires caused significant adverse economic effects to the incomes of those living in the disaster areas.



The township of Kinglake suffered the loss of many buildings.

Image: CSIRO

While incomes of males and female were affected there was a steeper decline in female income (14 per cent vs 9 per cent), individuals in the low-income group were most vulnerable with an 18 per cent drop.

While the income of employed people fell significantly (8 per cent), there was no significant income effect on unemployed individuals, presumably because they continued to receive their entitlements.

Looking at the incomes of different age groups, we found it was the 25-45 age group who experienced the most negative and significant income losses following the disaster.

Home renters suffered an average income loss of 14 per cent but the income decline for home owners was much less.

In terms of the individual's sector of employment, we found those who worked in agriculture lost 31 per cent of their income; the retail sector 13 per cent and the tourism sector 12 per cent.

However, individuals working in health care gained 8 per cent probably because they worked overtime. In economics literature this is known as the creative destruction effect of disasters.

Finally, individuals who moved out of the disaster zones are associated with a 19 per cent decline in their incomes.

These results confirm the need to dig deeper beyond aggregate and community trends and investigate the effects at the individual level.

The big four

There are four major implications from our research.

First, while average income effect is informative, the story is in the detail. Individual demographic groups and sectors of employment point to sizeable economic vulnerabilities.

Second, disaster recovery and relief assistance arrangements could be enhanced by considering an individual's vulnerabilities with a view to enhancing their economic resilience. In other words, there is room to re-think how we build a sustainable disaster recovery model on limited budgets.

Third, the migration effects of the Black Saturday bushfires are substantial. Bushfires are frightening and devastating. We found that the Black Saturday bushfires had permanent effects on an individual's location decisions in terms of moving out and not returning. This finding is also supported by anecdotal evidence.

Finally, the social effects were extremely negative and resulted in significant adverse mental health effects. Reduced incomes and financial capabilities were critical factors behind deteriorating mental health of the individuals who lived in the disaster zones.

The future

With the frequency and cost of natural disasters predicted to increase, research will play a crucial role in assisting governments with decisions on how to best allocate disaster funding. If there is \$100,000 in a budget, should it be spent on a fire truck or on bushfire prevention education? These are policy and decision-making problems and governments need the evidence to make these decisions appropriately.

Migration decisions – either into or out of – disaster-hit areas are also an important future avenue of research that could offer substantial policy implications.