The Impact of Drought on Mental Health and Alcohol Use

Ben Edwards and Matthew Gray, Australian Institute of Family Studies
Boyd Hunter, CAEPR, Australian National University
Increase in mean temperatures

Australian-average mean temperature anomalies

Source: CSIRO, BOM 2008
Temperature increase has been in the central and east of Australia

Figure 2b. Regional trends in annual mean temperature since 1950.

Source: CSIRO, BOM 2008
Most of east & south west Australia has become drier

Figure 4b. Regional trends in annual rainfall since 1950.

Source: CSIRO, BOM 2008
Drought and families: what do we know?

No large-scale studies in Australia or internationally
In Australia, focus on in-depth studies of particular communities:

- Drought in the 1990’s- 103 adults in NSW & QLD  
  (Stehlik, Gray & Lawrence, 1999)
- Social impacts of drought -3 NSW communities, 62 interviews  
  (Alston & Kent, 2004)
- Children & drought - 334 children in a NSW community  
  (Dean & Stain, 2007)
What is drought?

1. Meteorological – degree & duration of dryness compared to an average for the area
2. Hydrological – on water supply (stream flow, reservoir/lake water levels & ground water levels)
3. Agricultural - 1 & 2 with agricultural impacts, soil moisture deficits
4. Social definitions - drought based on personal experience of the above

Many indices, no agreed measure, Bureau of Rural Sciences define drought as a 1 in 20 year event
AIFS study design

8,000 RDD interviews stratified by rainfall in the postcode in the last 3 years compared to the last 100 in September to December 2007

BOM rainfall data with four equal groups:

- Severe drought (0-5%)
- Moderate drought (6-10%)
- Below average rainfall (11-49%)
- Above average rainfall (50-100%)
AIFS study design

Selected SLAs had at least 10% of population employed in agriculture or a related service industry (ABS Census, 2001)

Two quotas:

- At least 30% households with one person currently employed in agriculture or a service related industry or has been in the last 3 years (45% respondents)
- No more than 55% of respondents female were to be interviewed (53%)

  - Females tend to be more likely to agree to participate in CATI
Operational definitions

Percentiles for the last 3 years to last 100 years for:

- Meteorological – rainfall
  - Bureau of Meterology - BOM

- Social definition - perception of drought
Social definition of drought

- Currently in drought -60%
- Drought in the last year but not currently -13%
- Drought in the last 3 years but not in the last year and not currently -5%
- Not in drought in the last 3 years -22%

Four mutually exclusive categories created

Agreement within postcodes is remarkably high, ICC = .57
Interview

- Drought perceptions, other natural disasters
- Demographics
- Mobility – household members, respondent
- Employment
- Income and financial hardship
- Farming issues
- Health – physical, mental health, medication use for stress, alcohol use
- Relationships – couple, separations, whole family functioning
- Community – social cohesion, decline in key services, member of organisation(s)
Mental health and medication for stress

- Mental Health Inventory from the SF-36 (less than 52)
- In the last 12 months, have you been prescribed drugs by a doctor, such as anti-depressants, to help you cope?
Alcohol Use

High or hazardous drinking
- Men: 15 or more standard drinks per week
- Women: 8 or more standard drinks per week

Binge drinking
- Women 5 or more standard drinks once in the last month
- Men 7 or more standard drinks once in the last month
Statistical analyses

- Logistic regressions
- Covariates
  - Age
  - Gender
  - Aboriginal or Torres Strait Islander status
  - Education
  - Child in household
  - State by remoteness indicators
Mental Health
Mental health problems, by drought definition

- Severe drought: 11%
- Drought: 11%
- Below average: 10%
- Above average: 11%
- Current drought: 12%
- Drought in last year: 10%
- Drought in last 3 years: 8%
- No drought in last 3 years: 7%
Mental health by Social Definition and employment status

![Bar chart showing mental health by social definition and employment status.](chart.png)

- **Farmer**
  - Current drought: 0.17
  - Drought last year: 0.11
  - Drought last 3 years: 0.08
  - No drought: 0.12

- **Farm Manager**
  - Current drought: 0.11
  - Drought last year: 0.06
  - Drought last 3 years: 0.04
  - No drought: 0.11

- **Not Employed**
  - Current drought: 0.21
  - Drought last year: 0.16
  - Drought last 3 years: 0.14
  - No drought: 0.1

- **Employed but not agriculture**
  - Current drought: 0.09
  - Drought last year: 0.08
  - Drought last 3 years: 0.08
  - No drought: 0.08

*Australian Government*
*Australian Institute of Family Studies*
Medication use for stress
Medication use for stress, by drought definition

<table>
<thead>
<tr>
<th>Rainfall Deficit</th>
<th>Social Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe drought</td>
<td>10.7</td>
</tr>
<tr>
<td>Drought</td>
<td>10.6</td>
</tr>
<tr>
<td>Below average</td>
<td>11.0</td>
</tr>
<tr>
<td>Above average</td>
<td>10.9</td>
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<tr>
<td>Currently in drought</td>
<td><strong>11.8</strong></td>
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<tr>
<td>In the last year</td>
<td>9.8</td>
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<tr>
<td>Last 3 years</td>
<td>11.2</td>
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<tr>
<td>Not in drought</td>
<td><strong>8.8</strong></td>
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Alcohol Use
High or hazardous drinking

<table>
<thead>
<tr>
<th>Condition</th>
<th>Percent</th>
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<tbody>
<tr>
<td>Severe drought</td>
<td>23.6</td>
</tr>
<tr>
<td>Drought</td>
<td>24.0</td>
</tr>
<tr>
<td>Below average</td>
<td>26.0</td>
</tr>
<tr>
<td>Above average</td>
<td>27.5</td>
</tr>
<tr>
<td>Currently in drought</td>
<td>24.0</td>
</tr>
<tr>
<td>In the last year</td>
<td>27.2</td>
</tr>
<tr>
<td>Last 3 years</td>
<td>26.5</td>
</tr>
<tr>
<td>Not in drought</td>
<td>27.1</td>
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Rainfall Deficit | Social Definition
High or hazardous drinking: Males

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<tr>
<td>Severe drought</td>
<td>20.1</td>
</tr>
<tr>
<td>Drought</td>
<td>24.7</td>
</tr>
<tr>
<td>Below average</td>
<td>23.7</td>
</tr>
<tr>
<td>Above average</td>
<td>24.6</td>
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</tr>
<tr>
<td>In the last year</td>
<td>24.2</td>
</tr>
<tr>
<td>Last 3 years</td>
<td>20.2</td>
</tr>
<tr>
<td>Not in drought</td>
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Binge Drinking

<table>
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<th>Percent</th>
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<tbody>
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<td>12.5</td>
</tr>
<tr>
<td>Drought</td>
<td>11.9</td>
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<td>Below average</td>
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<td>12.1</td>
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Conclusions

- Significant impact of drought, socially defined, on mental health and medication use for stress, in particular farmers and the not employed

- Lower rates of high or hazardous drinking in drought areas (rainfall and social definition)
  - For females in particular

- No evidence of self-medication
Future directions

- Incorporating mobility into models
- Developing an agricultural definition of drought
- Taking an epidemiological approach by generating estimates of the impact on numbers of people
- Investigating farm poverty
References from the AIFS study


Residential Mobility and Drought

- Relatively high rates of mobility between areas may be an effect of drought and threaten the validity of a cross-sectional study.
- Area-level migration data from the last three Australian census linked with rainfall data (Hunter & Biddle, 2009)
Net-migration by drought (rainfall)

Rainfall deficits 3 years prior to the 2006 census includes (severe and drought)

OLS regression adjusted estimates:
- Drought area - 0.60% (1.42) less than non-drought area
- Below average 1.07% (0.93) less than non-drought area
Rainfall percentiles from BOM in the survey data

Rainfall distribution (BOM)
Australian policy context - support in the context of climate change


“ The review will support the development of policies to help better prepare farmers and rural communities for a changing climate. The review will include:

- an economic assessment of drought support measures by the Productivity Commission
- an assessment by an expert panel of the social impacts of drought on farm families and rural communities
- a climatic assessment by the CSIRO and the Bureau of Meteorology of the likely future climate patterns and the current Exceptional Circumstances standard of a one-in-20-to-25-year-event.”