



# We know drought affects mental health but the devil is in the details

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## Background and rationale

It is well established that the relationship between drought and mental health is complex. However, little is known about (i) how drought duration affects (associates with) mental health (especially when the drought lasts for years) and (ii) how long poor mental health persists after a drought.

This study aims to investigate the effects of drought on mental health, and how these effects change with continued exposure to drought conditions,

Based on previous research, this study hypothesises a linear relationship between drought and mental health. It also includes exploratory analyses investigating a non-linear relationship between these constructs.

## Data and methods

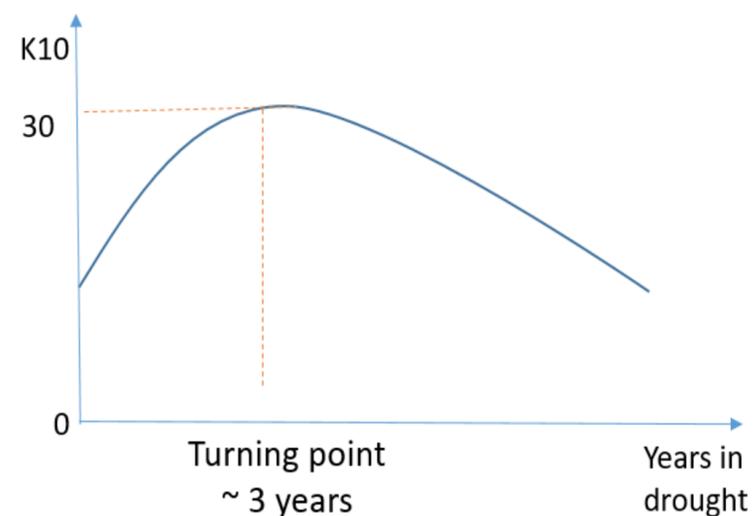
**The study population** comprised participants in the Australian Rural Mental Health Study (ARMHS)\*

**Drought exposure** was measured by the number of years ARMHS participants experienced during their most recent drought period (the Hutchinson Drought Severity Index- HDSI and Standardised Precipitation Evapotranspiration Index - SPEI are used to identify drought periods and duration of each period.

**Mental health** was assessed using the Kessler-10 (K10) (asking the frequency of ten symptoms of psychological distress in the last month ) and the Satisfaction with Life Scale (SWLS) (asking the level of agreement about general satisfaction with life).

**Data analysis:** The main method is regression models in generalised estimating equation (GEE) framework.

## Drought and psychological distress



**Figure 2: The non-linear relationship between drought and psychological distress**

The regression results did not identify a statistically significant linear relationship between drought exposure and psychological distress, but suggest a significant non-linear relationship between drought exposure and psychological distress (HDSI;  $p < 0.001$ , and SPEI;  $p < 0.001$ ).

This relationship follows an inverted U-shape, where drought initially leads to increased psychological distress, but then distress begins to decrease after a threshold level of drought exposure (Figure 2).

While people ultimately are likely to adjust to drought (i.e. their distress begins decrease), it takes about three years for this to occur, and during which time distress consistently increases. This might be because it takes time (e.g. months or years) after droughts have started to be able to see or identify drought, and drought impacts also develop gradually and can persist for years. Therefore, the first years of drought could bring many uncertainties as well as potential risks to factors such as financial security, leading to persisting distress.

## Drought and life satisfaction

The results show that drought exposure, identified by HDSI, is negatively related to life satisfaction ( $p < 0.05$ ). Holding all other variables constant, a one-year increase in drought exposure reduces satisfaction with life by 0.083 points (on the 5-35 scale).

Despite of the small effect, this result can be interpreted as supporting the negative effects of drought on mental health. When using SPEI to define drought, the effect of drought exposure on life satisfaction was statistically non-significant.

Beside, there was no significant non-linear relationship between drought exposure and life satisfaction when using either HDSI or SPEI to measure drought exposure.

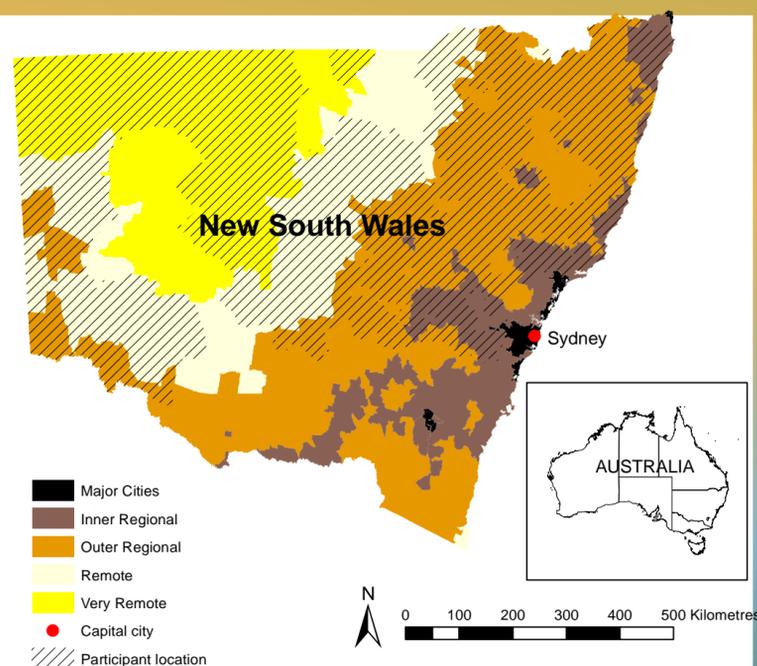
## Summary

Using a panel dataset from the Australian Rural Mental Health Study, we found a nonlinear relationship between drought exposure and mental health where people experienced an increase of psychological distress for the first ~3 years of drought, after which time this distress dissipates. However, this does not necessarily mean people have good mental health because, for example, factors such as life satisfaction decreased as drought persisted. This is important as it highlights the need for sustained support to mitigate the long-term effects of drought on mental health that persist after the drought has apparently finished.

\***ARMHS** is a postal survey which aimed to study mental health and its determinants in rural people in New South Wales (NSW), Australia.

The ARMHS data was collected through four waves (from 2007 -2013) including a baseline survey and three follow-up surveys.

In short, a total of 2639 participants consented and completed the baseline survey from an initial 9681 invitations.



**Figure 1: Participant location**