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Mining and income distribution in regional Australia

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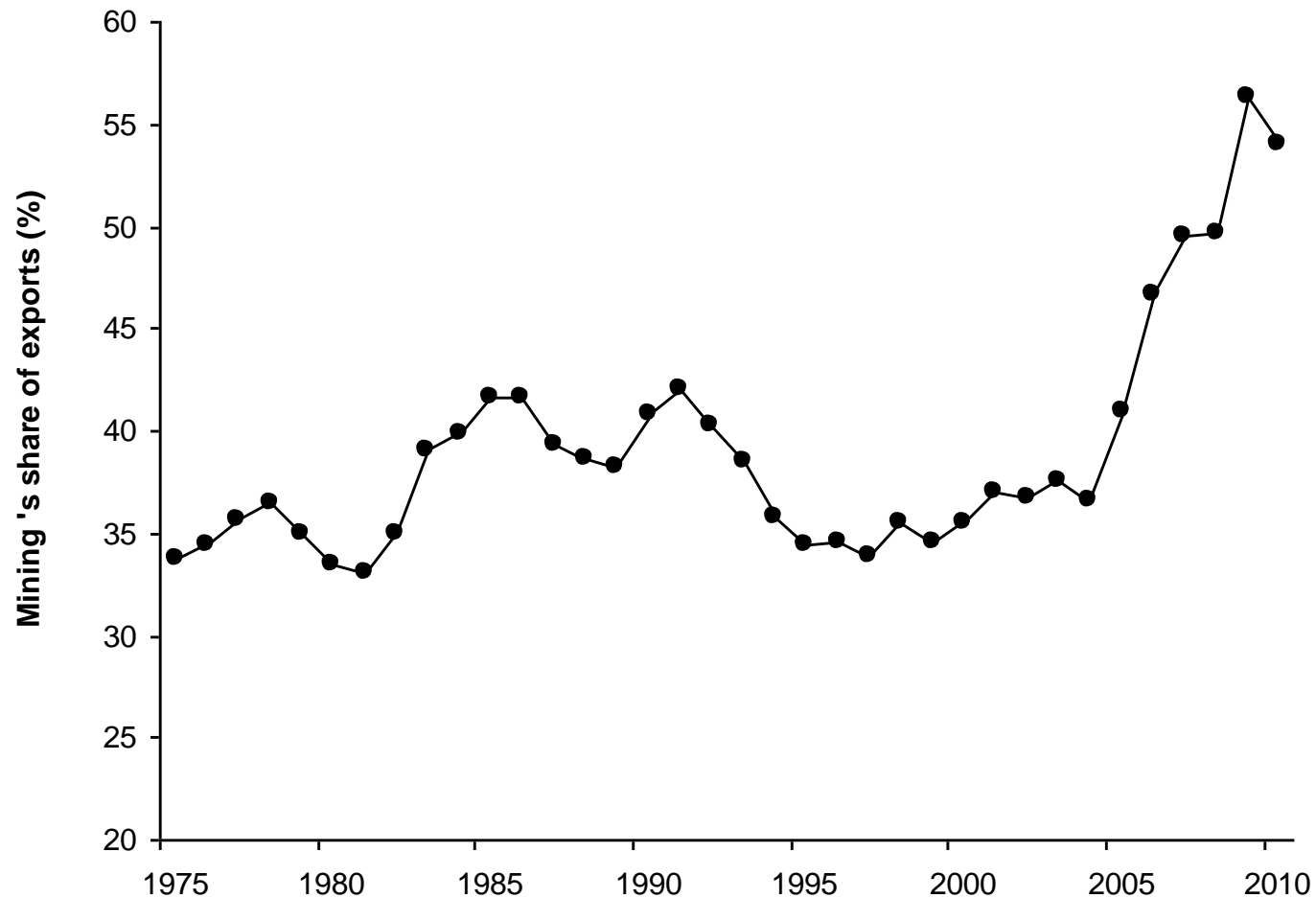


Overview

- Background on mining and the national economy
- Consider impact of mining on other sectors
- Methods: measuring income inequality with Gini co-efficient
 - A widely used measure of income distribution
- Show colourful maps and (plain) charts on this topic
- Conclusions about the relationship between mining employment and equality of income distribution

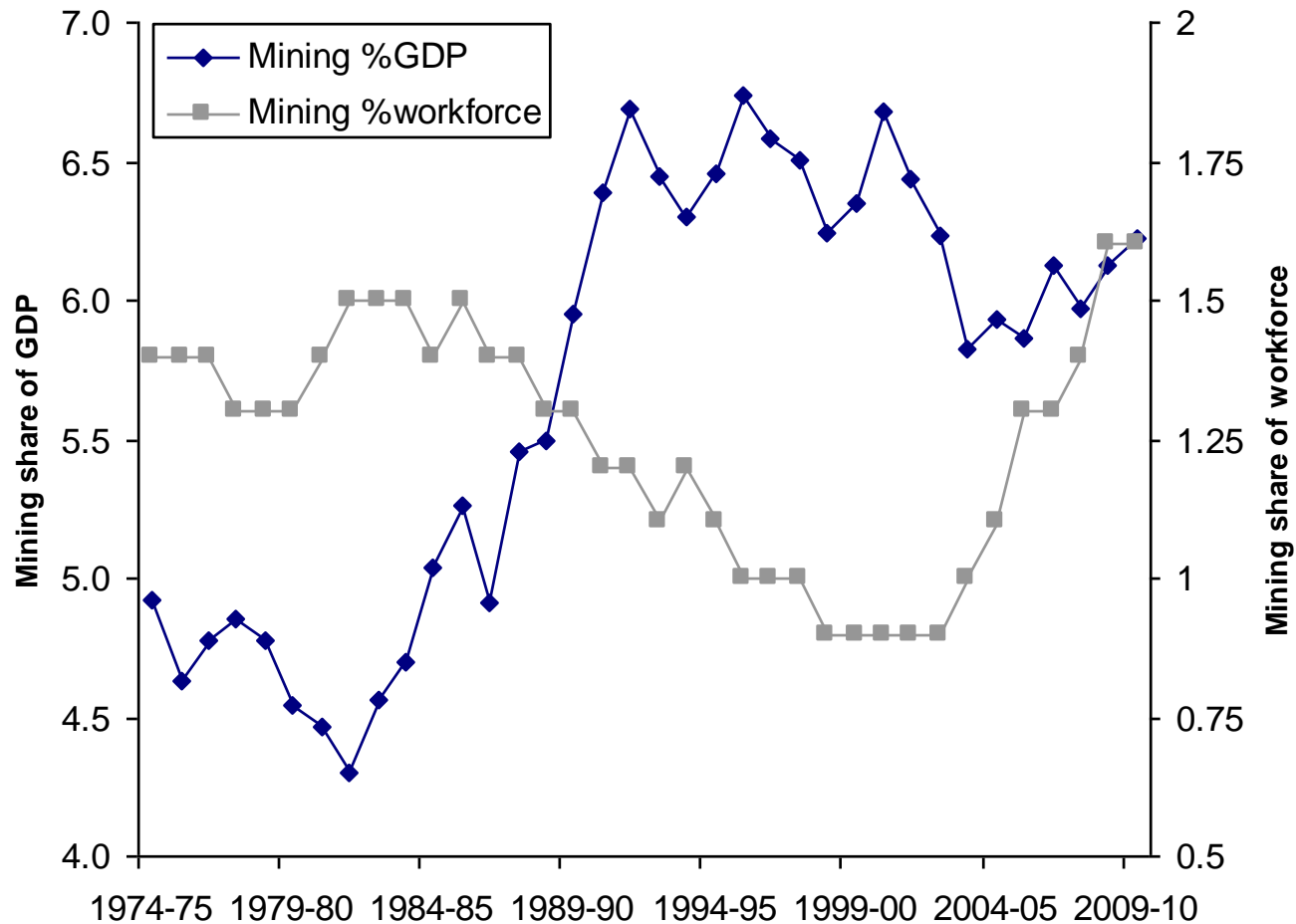
Mining is a big part of the national economy

- Mining is our largest export sector (by far...)



Mining is not a huge employer

- Mining contributes around 6% to GDP
- And accounts for around 1.5% of the national workforce



Dutch disease in Australia?

- A mining boom is great for miners, but what about other sectors?
- Mining can cause impacts for other sectors e.g. by putting upward pressure on interest rates and currency
- ‘Dutch disease’ named from Holland in the 1960s following the rapid expansion of North Sea oil
 - Coincided with exchange rate increase
 - Other industries lose international competitiveness
- Other industries also affected by:
 - Higher wages and/or loss of staff
 - Higher operational costs (e.g. finance costs)

Dutch disease in Australia?

- We know that mining regions have higher salaries compared with non-mining regions (Baum et al. 2005)
- Much of this work compares averages between regions (Hajkowicz et al 2011)
- But what about income distribution in mining locations?
 - Some may benefit while others are left worse off
- Income (in)equality as also a measure of well-being
 - How is this impacted by mining?

What is the role of gender?

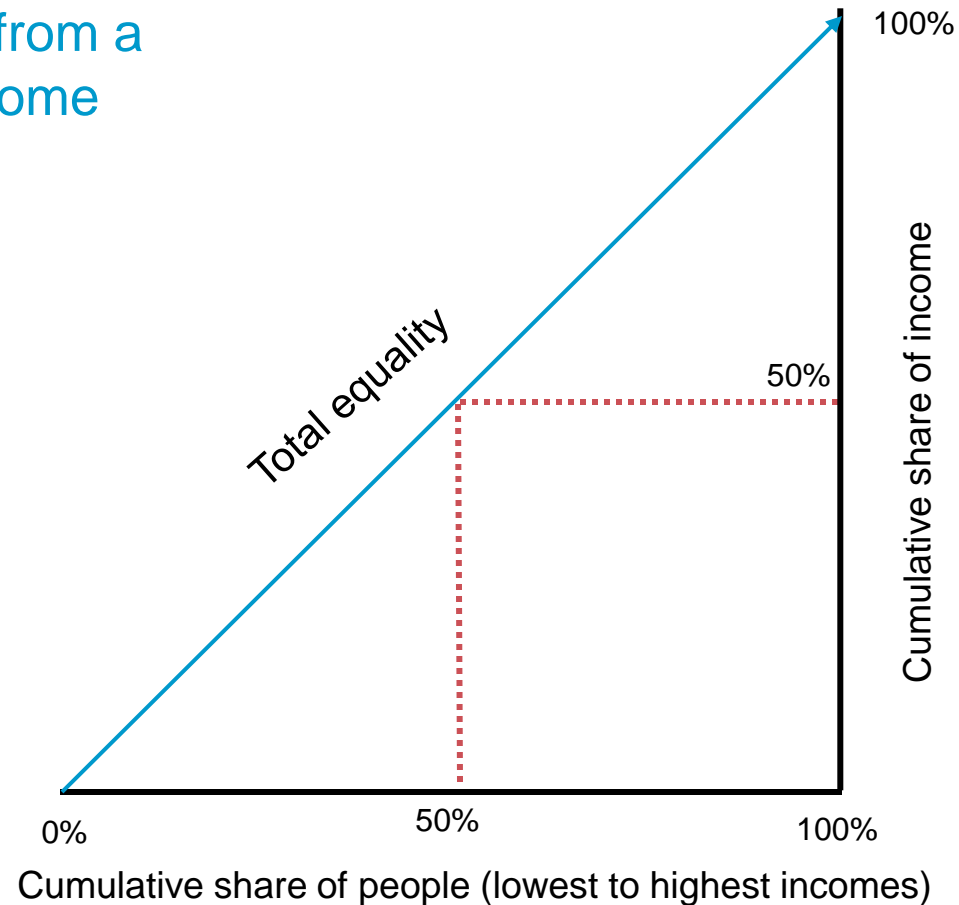
- Gender plays a role in different labour markets
- Link to relative advantage/disadvantage of sectors (Stimson 2001)
 - These are spatially explicit
- Men and women may be impacted differently by the mining boom

Our hypothesis

- We set out to test the relationship between mining and income distribution
- Our hypothesis:
 - H0: Mining activity does *not* influence distribution of income in regional Australia
 - H1: Mining activity does influence the distribution of income in regional Australia

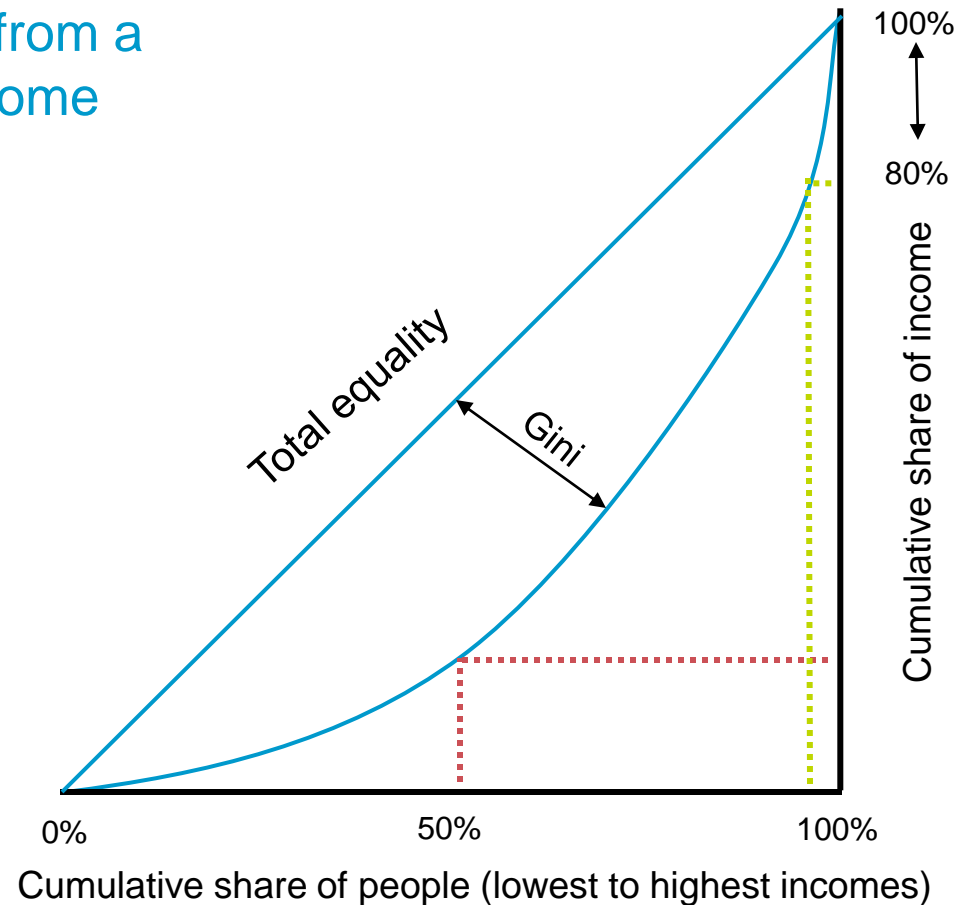
Methods: the Gini index of income distribution

- Gini coefficient represents the divergence from a totally equal income distribution



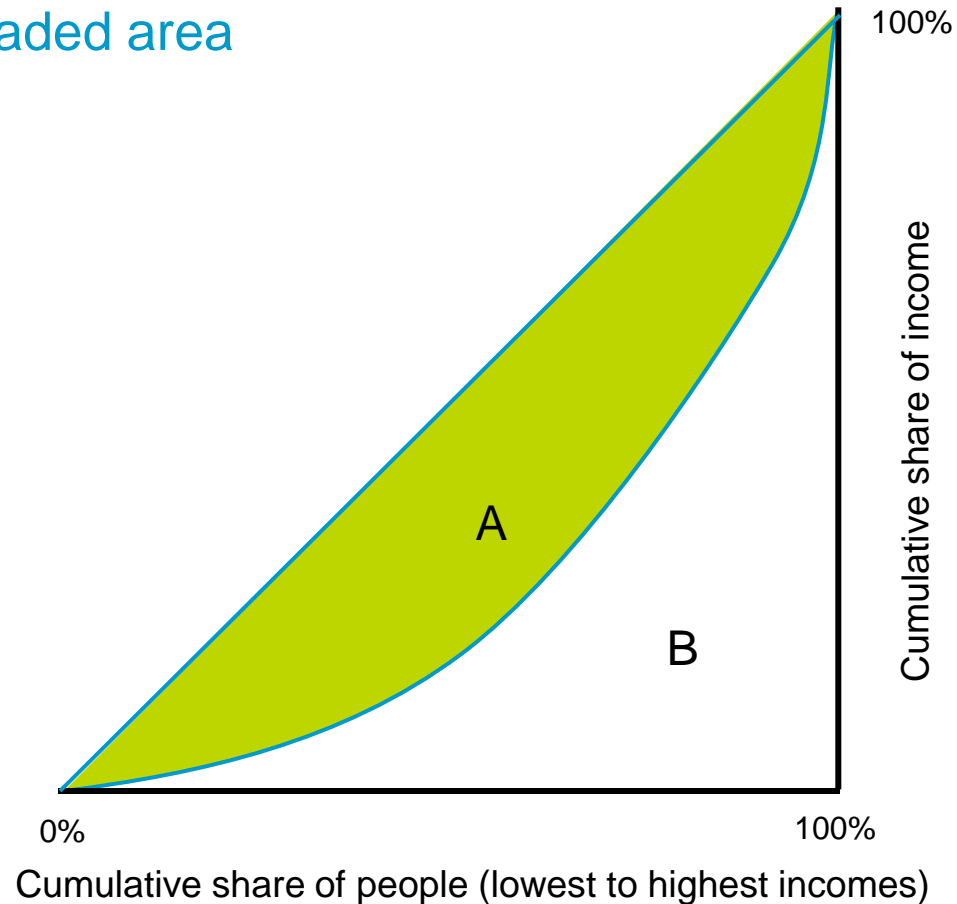
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Methods: the Gini index of income distribution

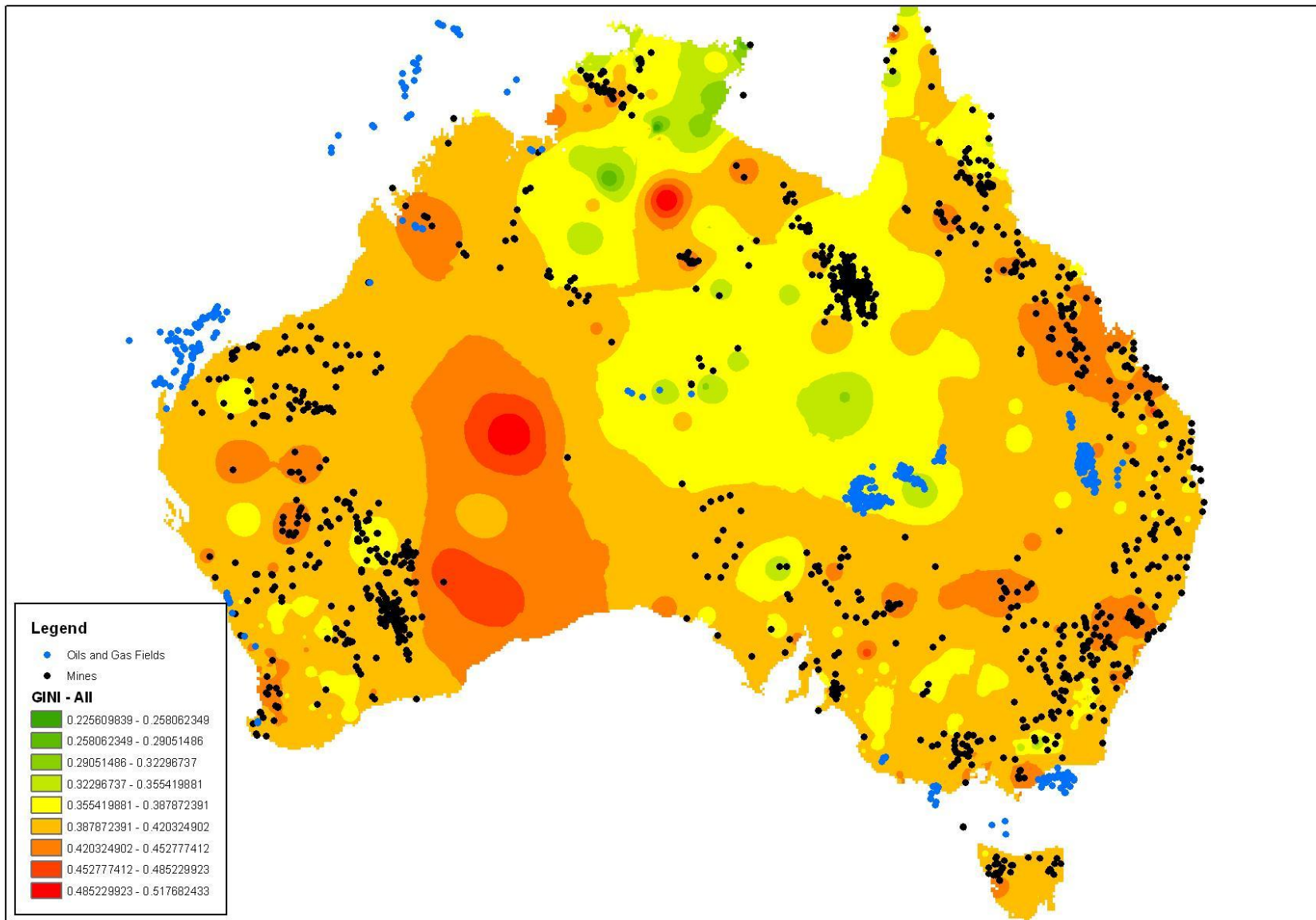
- Gini coefficient measured by the green shaded area
- $A/(A+B)$
- 0 - 1 index



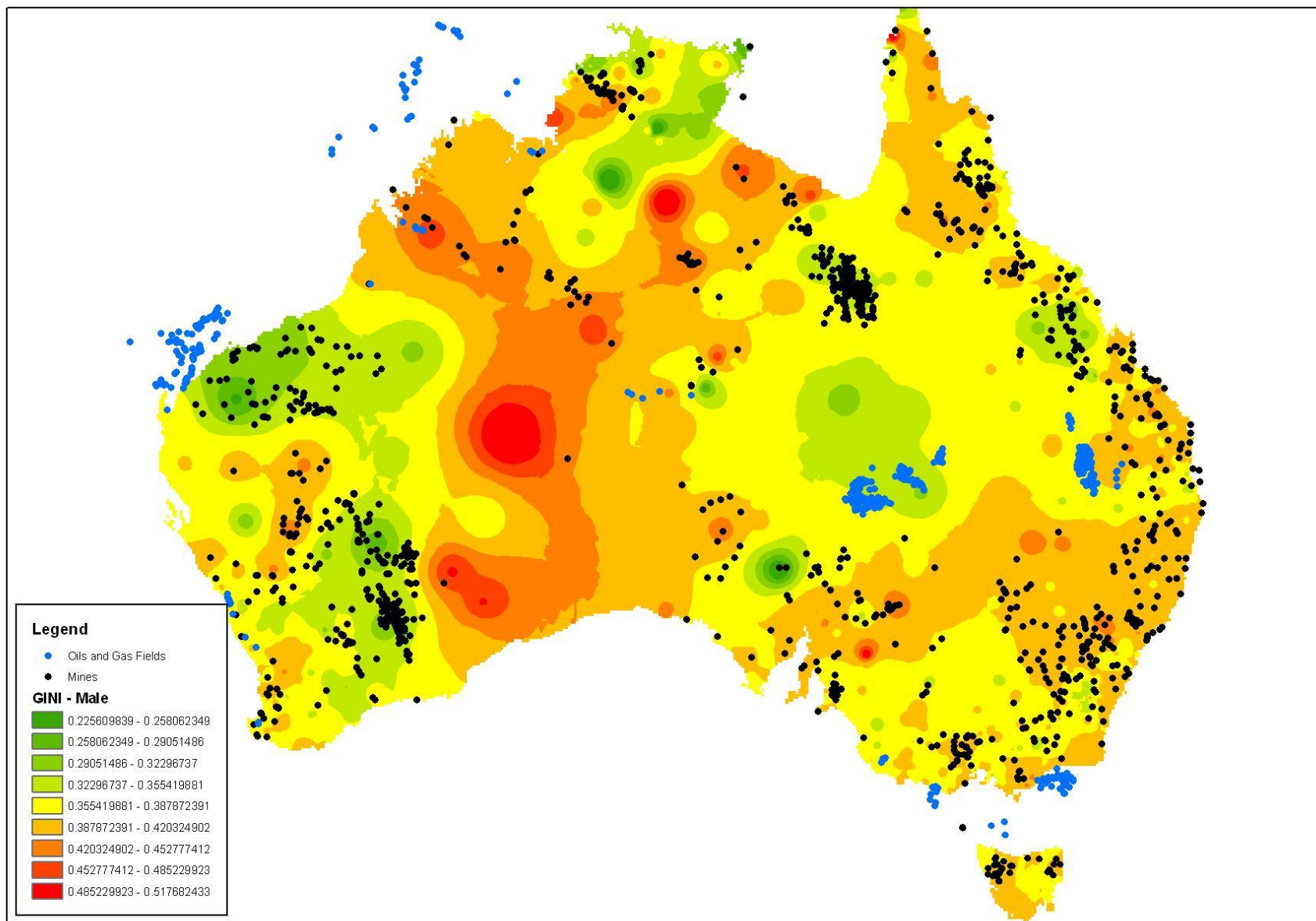
Methods

- Looked at 2006 Census data
 - Initially for all statistical local areas (circa 1400 SLAs)
- Considered individual gross income for:
 - All persons, males and females
 - *At place of usual residence*
- Calculated Gini for each SLA in Australia (2006 Census)
- Compared with % directly employed in mining per SLA
 - Not considering services to mining in this analysis
- Also tested remoteness
- Excluded major cities
 - 781 non-metro SLAs
- Linear regression of Gini against % mining employment
- Using a restricted cubic splines model

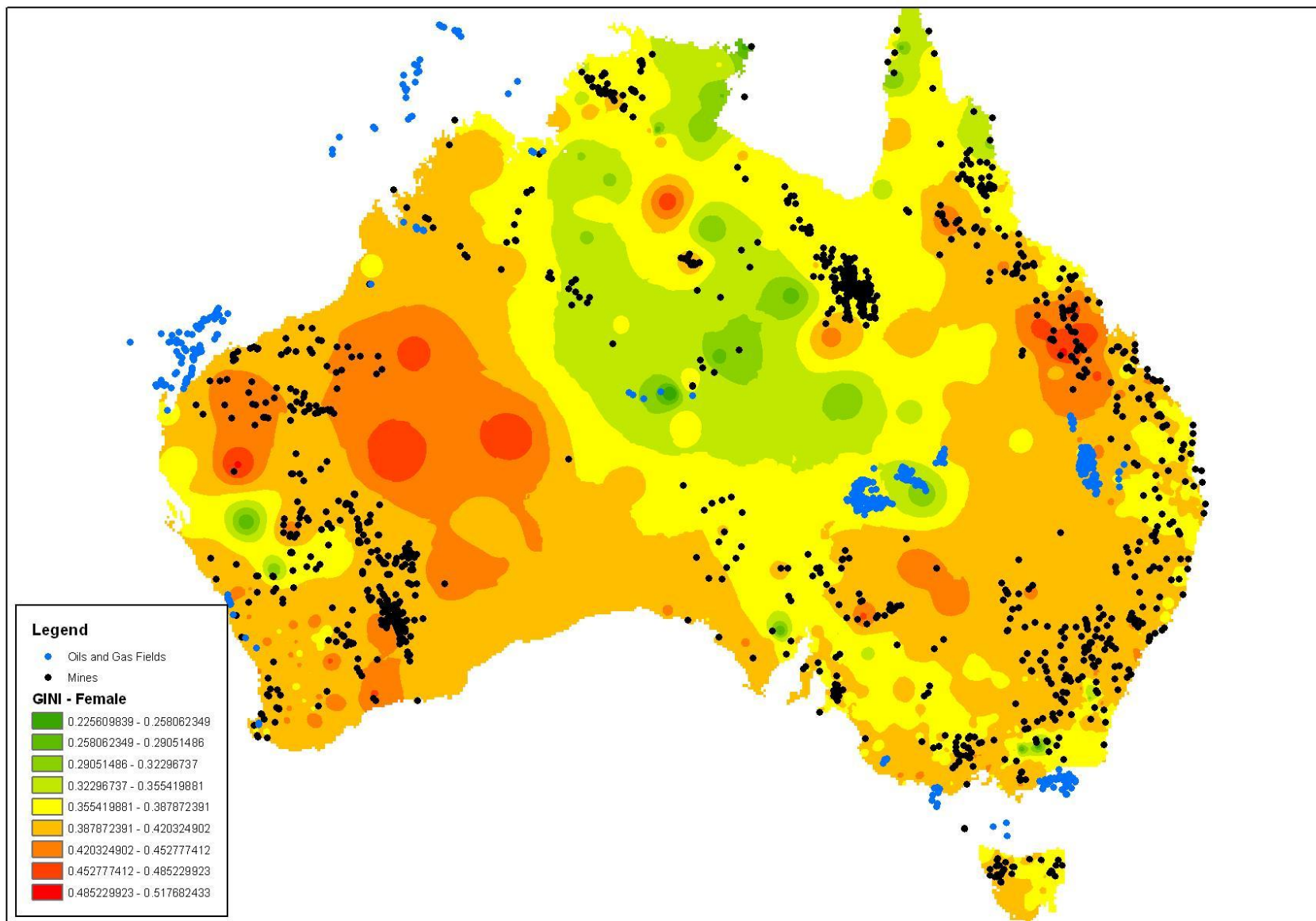
Gini distribution (all persons)



Gini distribution (males)



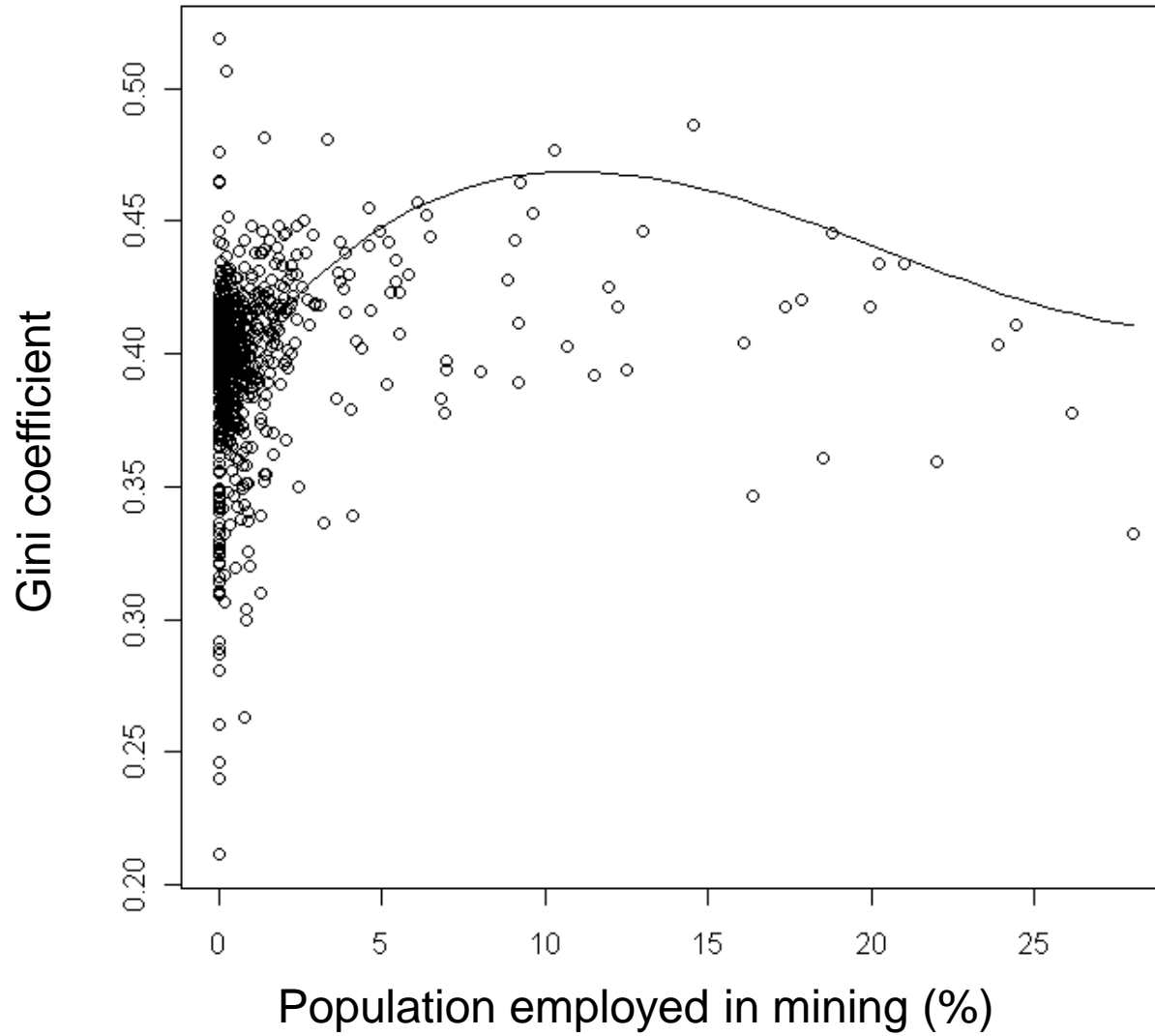
Gini distribution (females)



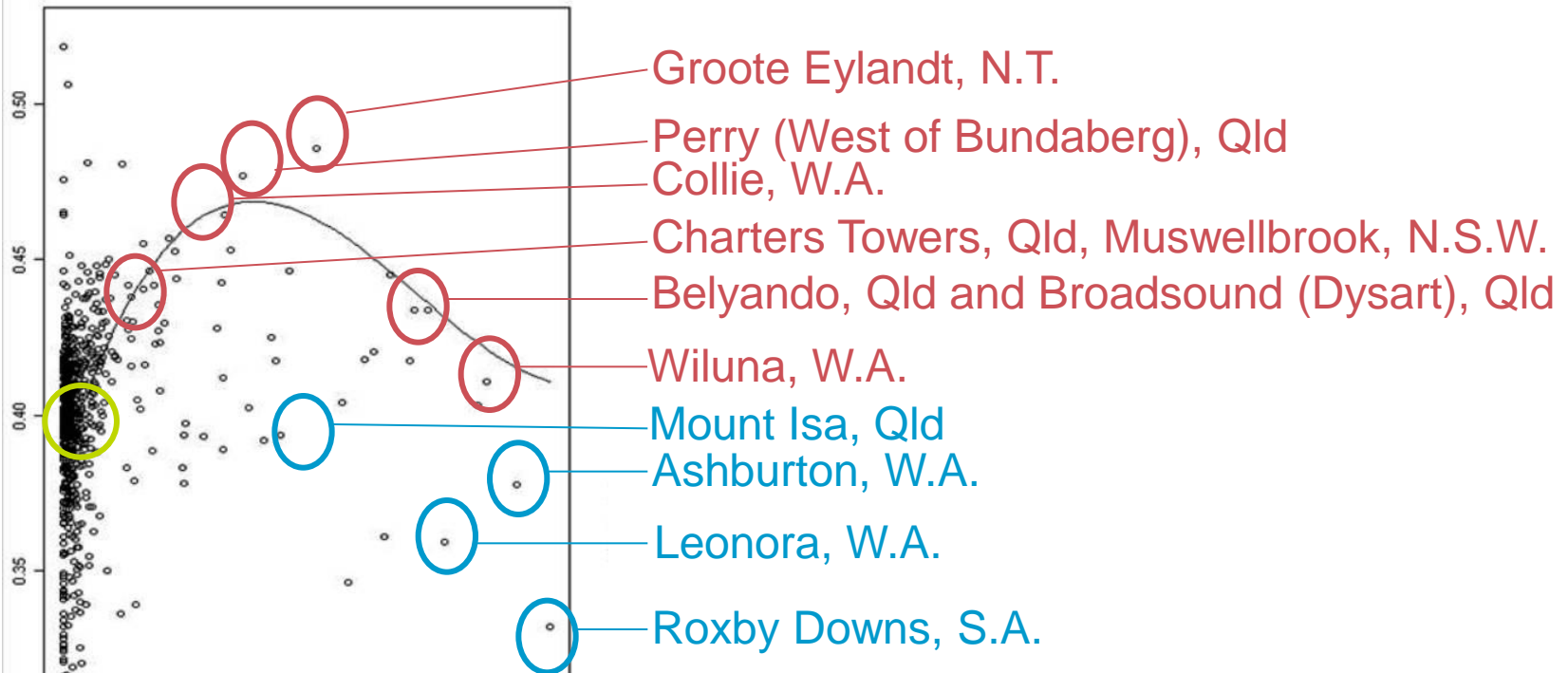
Statistical results

- Mining has significant, non-linear relationship with Gini for males, females and all persons
- Remoteness has significant positive relationship to Gini
- We found differences between the regression scores of different states
- NB: Average for all SLAs Gini = 0.4

Non-linear relationship

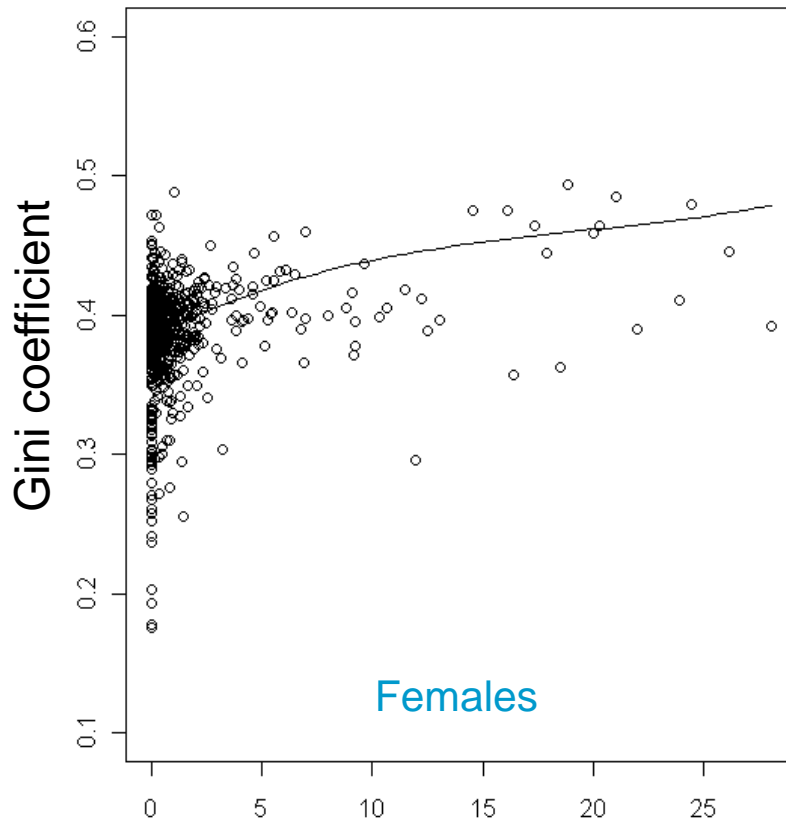


It varies depending on how much mining you have...

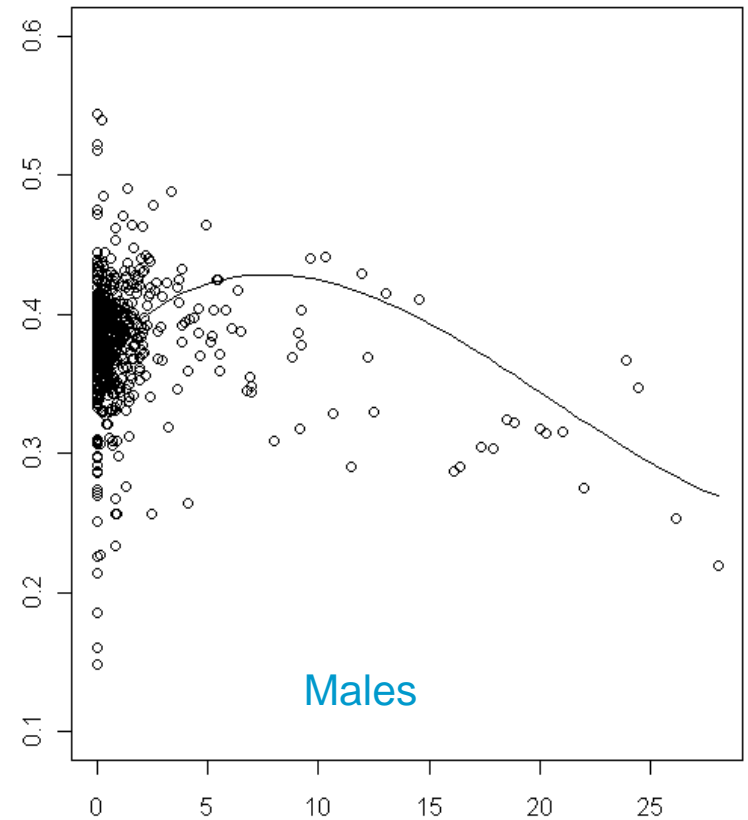


Mean Gini = 0.4

Data exploration: gender differences



Females



Males

Population employed in mining (%)

Discussion

- State is significant
 - 4/5 highest mining locations (by employment) are in WA
 - All have relatively equitable income distributions
- As the proportion of workforce in mining increases there are more people on higher incomes
- Initially this increases inequality
- Eventually more people are on a higher wage so inequality decreases
- As you get into pure mining towns most people are on high incomes
- This holds true for non-metropolitan regions that supply labour on Fly-in Fly-out (or DIDO)

Conclusions

- Mining does influence the distribution of income
- The impacts are very different for men and women
- Overall, settlements with mixed economies and small numbers of miners tend to have less equitable income distribution
- Overall, settlements with many miners tend to have more equitable income distribution
 - Need to be careful how to interpret these results
- Need for further research
 - Consider how this effects particular towns
 - How does this change over time?
 - Are existing residents benefiting or being displaced (or both)?

Acknowledgements

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- Thanks to Karin Hosking for data processing
- Thanks to Art Langston for preparing the maps