



# Socioeconomic deprivation and benzodiazepine / Z-drug prescribing: a cross-sectional study of practice-level data in England.



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## Background

- Benzodiazepines and Z-drugs (such as zopiclone) are prescribed for a variety of indications, including sedation and insomnia
- Risks of these drugs include dependence, cognitive impairment and respiratory depression
- In the UK, around 300,000 people are on long-term prescriptions for benzodiazepines, despite the recommendation that they should be given for a maximum of 4 weeks<sup>1,2</sup>
- Prescription rates are higher in females and the elderly<sup>3,4</sup>
- It has been suggested that a relationship exists with deprivation<sup>5</sup>

## Aim

To determine whether there was an association between benzodiazepine/Z-drug prescribing (overall, and by individual drug) and practice-level socioeconomic deprivation in England.

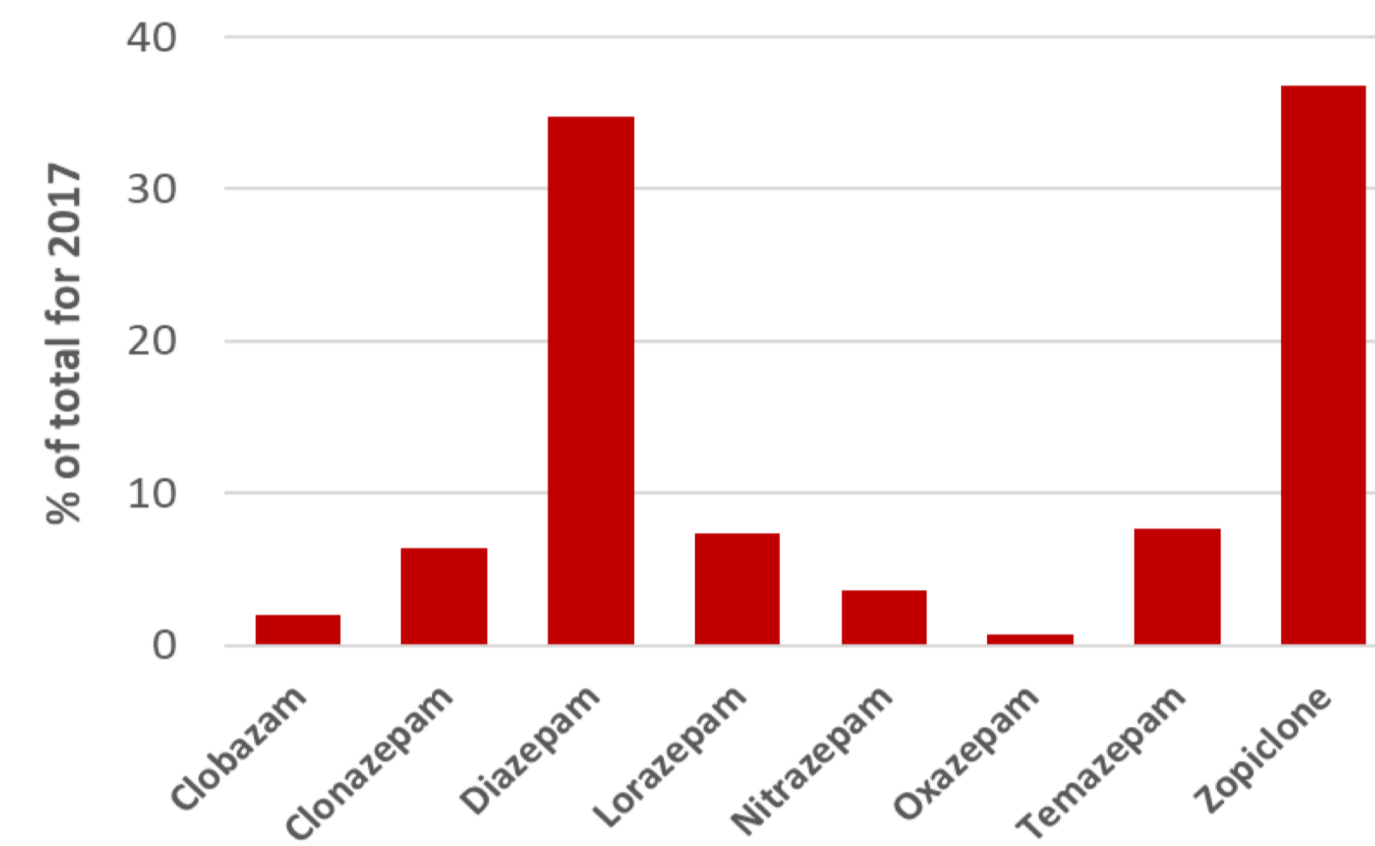
## Methods

- **DATA SOURCES**
  - Monthly prescribing data for 2017 – NHS Digital
  - Practice-level age and sex structure – NHS Digital
  - Benzodiazepine equivalence doses – British National Formulary
  - Practice/CCG Index of Multiple Deprivation (IMD) Score - PHE
- **DATA PROCESSING**
  - Monthly prescriptions aggregated over 2017
  - Total mg diazepam-equivalent calculated
  - Prescribing calculated as mg diazepam-equivalent per 1000 patients
  - Data processed (1) per practice and (2) per CCG
- **ANALYSIS**
  - To compare prescribing by IMD score decile, we calculated means + 95% confidence intervals
  - To examine independent associations, multiple linear regression used, to include: % males, % >65s, practice list size, IMD score
  - To allow visualisation of prescribing inequality, choropleth maps were produced at CCG level
  - A bivariate choropleth map was produced to visualise both deprivation and prescribing rates at CCG level (by tertiles)

## Results

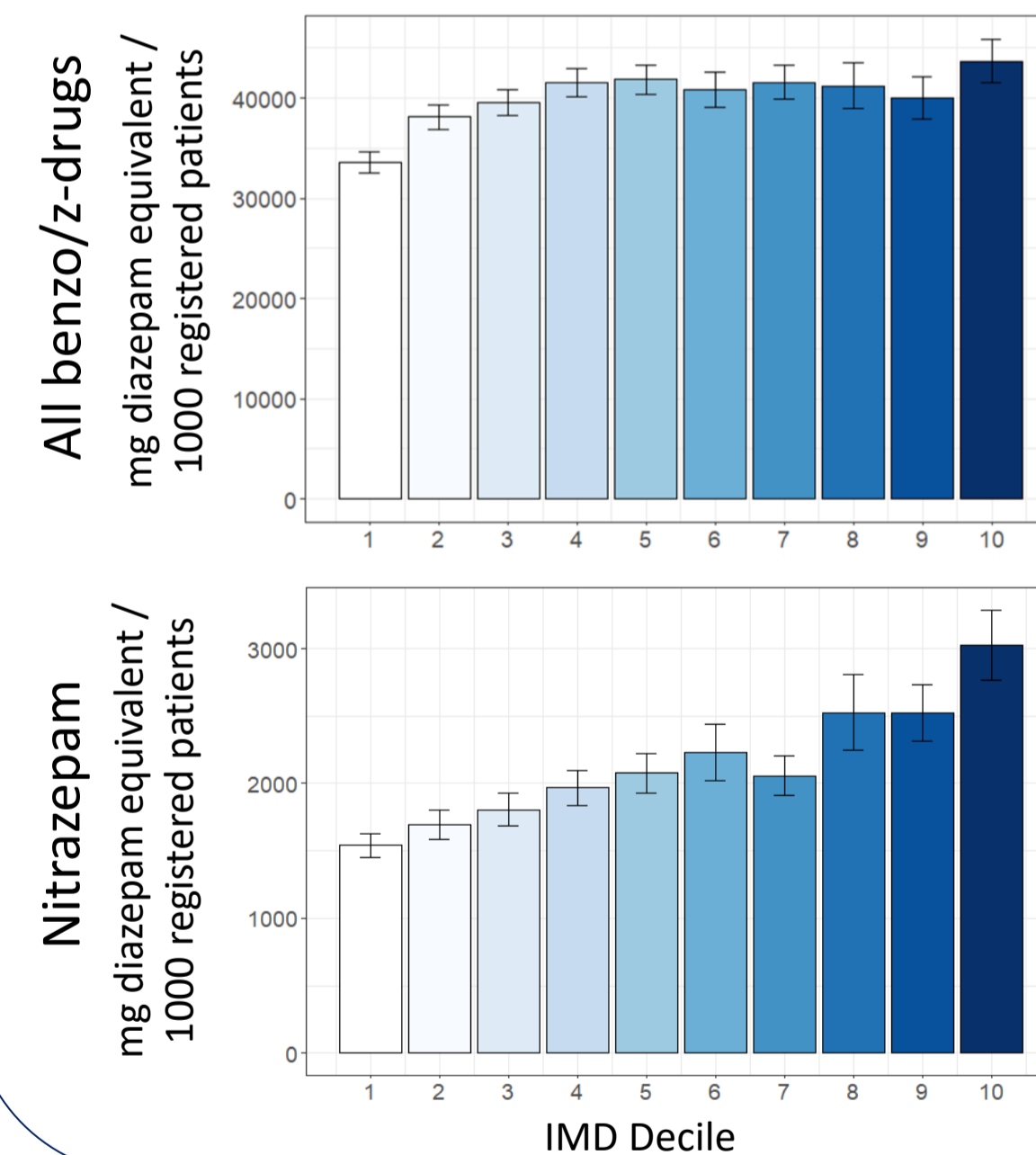
**Figure 1. Proportion of each drug prescribed**

- Proportion of total number of items of benzo/z-drugs



**Figure 2. Prescribing by practice IMD decile**

- For total benzo/z-drugs (upper) and nitrazepam (lower)
- A step-wise increase in prescribing by IMD decile is more apparent for some drugs but not overall

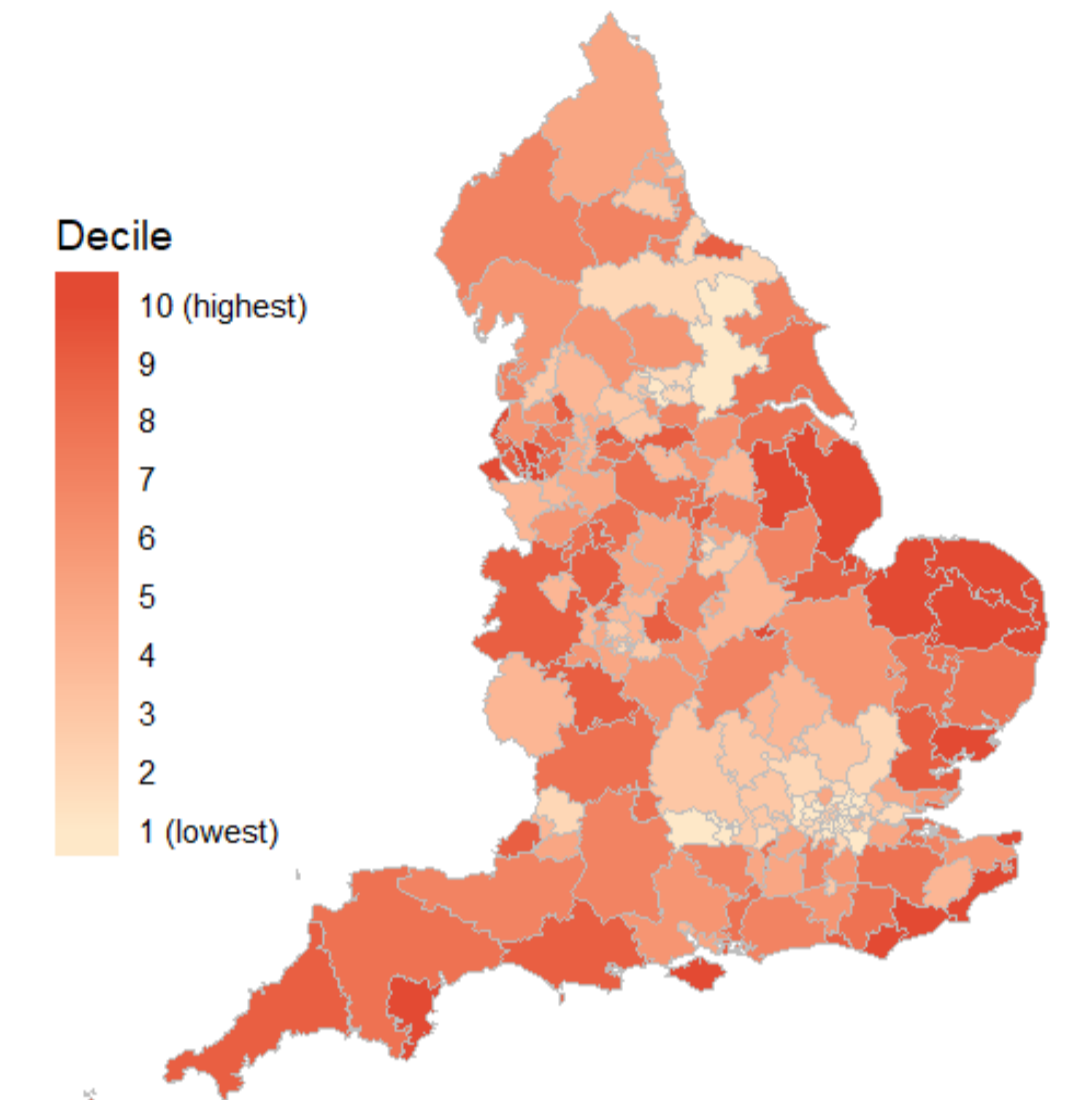


**Figure 3. Summary of regression analyses**

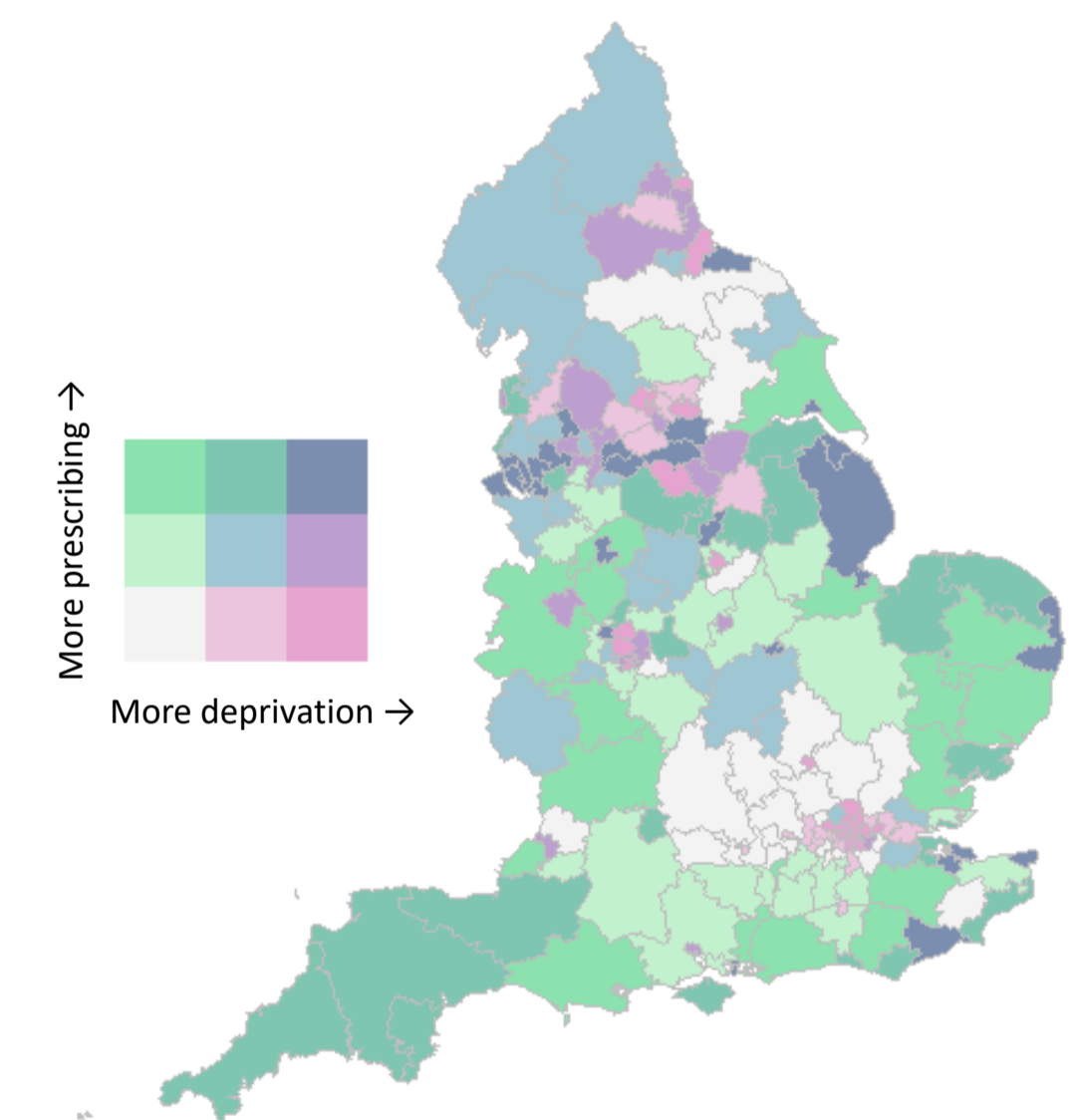
- Association between practice IMD score and prescribing per 1000 registered patients
- For each individual drug, and for all drugs in total
- Beta values show the extra amount of mg-equivalent diazepam prescribed per 1000 patients for each one-point increase in practice IMD score
- Multiple R<sup>2</sup> values indicate the proportion of the variability in prescribing that is explained by the factors studied in the regression model

Drug		Univariate	Multivariable
<b>Total benzo/z-drug prescriptions</b>	Beta	164	628
	<i>p value</i>	< 0.001	< 0.001
	multiple R <sup>2</sup>	0.70%	18%
<b>Chlordiazepoxide</b>	Beta	22	20
	<i>p value</i>	< 0.001	< 0.001
	multiple R <sup>2</sup>	6.20%	13%
<b>Clobazam</b>	Beta	121	162
	<i>p value</i>	< 0.001	< 0.001
	multiple R <sup>2</sup>	8.00%	12%
<b>Clonazepam</b>	Beta	79	146
	<i>p value</i>	< 0.001	< 0.001
	multiple R <sup>2</sup>	1.20%	6%
<b>Diazepam</b>	Beta	73	164
	<i>p value</i>	< 0.001	< 0.001
	multiple R <sup>2</sup>	1.10%	7%
<b>Lorazepam</b>	Beta	50	114
	<i>p value</i>	< 0.001	< 0.001
	multiple R <sup>2</sup>	1.20%	11%
<b>Nitrazepam</b>	Beta	36	45
	<i>p value</i>	< 0.001	< 0.001
	multiple R <sup>2</sup>	6%	13%
<b>Temazepam</b>	Beta	37	55
	<i>p value</i>	< 0.001	< 0.001
	multiple R <sup>2</sup>	2%	8%
<b>Zopiclone</b>	Beta	4	83
	<i>p value</i>	0.47	< 0.001
	multiple R <sup>2</sup>	< 0.1%	13%

**Figure 4. Prescribing by CCG**



**Figure 5. Prescribing by IMD/CCG**



## Discussion

### Key Findings

- IMD score is independently positively associated with prescribing
- This association is seen more strongly in some drugs than others
- A large proportion of the variation in prescribing is not explained by IMD score, age/sex structure and practice list size.

### Further Work

- Analyses in individual patient-level datasets is required to determine the specific drivers for prescribing, to help identify interventions

### Limitations

- Analysis restricted to 2017; no time trends
- Only primary care prescriptions included
- Data available only at practice level
- Indications for prescribing unknown
- IMD scores are from 2015 (latest available) and also calculated at the practice level

### References

1. NICE. Hypnotics: Key therapeutic topic [KTT6]. 2018
2. Davies *et al.* BJGP 2017;67:e609-13.
3. Johnson *et al.* BJGP 2016;66:e410-5.
4. Olfson *et al.* JAMA Psych 2015;72:136-42.
5. Farias *et al.* Public Health Research Consortium, 2017.